# UNIVERSITY COLLEGE LONDON

# ANNUAL REPORT 1979-1980

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LL.M.

# FOREWORD BY THE PROVOST

## 1. *Personal Comments*

The responsibilities of the Provostship, which the session 1979–80 allowed me to enjoy learning, incorporate just one feature that could hardly surprise me: I had long been aware that an effective head of so big an organisation would necessarily have relatively little time for other activities. Indeed, I had always thought of UCL as one of the very few institutions whose outstanding academic strength and breadth would be a clearly sufficient compensation for those limitations on other activities that its headship would entail.

I was nevertheless determined to find a modest amount of time to continue some personal work in education and research alongside the extensive duties of the Provostship. During term-time, opportunities were extremely limited; but I did establish that to give a nine o'clock course of lectures in the Department of Mathematics was feasible, because hardly any committees start until after ten! Equally, I could give occasional seminar lectures on research topics and continue the supervision of a research student. However, it was only the advent of the spring vacation that allowed me to make a modest beginning on a new piece of mathematics, applied to a biomechanical problem; and only the summer vacation that allowed me to complete it and write it up.

I had much earlier found that, for the Provostship of UCL, it is something of an advantage to be an applied mathematician who has worked over many years on various aspects of the application of mathematics in the sciences, in engineering and in medicine. Certainly, my visits during this session to practically all of the UCL Departments with the object of discussing their work in detail were, in the case of a clear majority of Departments, significantly facilitated by that background of knowledge in related areas. I feel all the more grateful to staff in humanities and laws for their patience in working to educate a new Provost who, however keen to learn, was conscious of starting, in their subject areas, far behind his predecessors.

All these visits have helped me greatly in what I regard as one of the Provost's major tasks: to represent UCL externally so as to ensure that the academic world in general can become aware of the range and depth and importance of the College's work.

I found, furthermore, that I could improve my chances of carrying out such representations effectively if I introduced a specific procedure to this end.

I call this procedure the 'Academic Innovation at UCL Collection', which I started in December 1979 by writing to 100 members of staff. To each of them I mentioned a particular area of academic work (teaching or research) where I felt they had been particularly innovative, and invited them to write a relatively brief account of it that would be intelligible to a wider academic readership. Needless to say, my selection of just 100 staff members was made rather arbitrarily; certainly not on any criterion of absolute merit of the work concerned, but rather on a highly subjective criterion of likely interest to a wide audience. However that may be, I am glad to say that the response was excellent.

My very first action to use the Collection took the form of the composition of my Royal Society of Arts paper on 'Academic Innovation', published in May 1980 in the Society's Journal after an abridged version had been delivered on 27 February as the Society's Frederick Constable Lecture. I have been happy to note that the Lecture and paper have attracted wide-spread interest; which, indeed, has gone far towards achieving my principal objective in preparing this material.

Even in that relatively long paper, however, it was impossible to use contributions from certain large areas represented at UCL. For example, in the 'arts' field I was able to find space only for Fine Arts, Architecture, Planning, Laws and English, so that a big area which might broadly be characterised as 'humanities' was omitted. In section 2 of this Foreword, entitled 'Some Innovations in the Humanities', I have tried to remedy this omission by presenting a selective view of UCL activity in this field based on relevant contributions to my Collection.

One more area of omission from my February lecture is particularly easy to understand because University College Hospital Medical School became reunited with UCL only in April 1980. It took me three months after that to complete a programme of visiting what are now the UCL Departments in the Faculty of Clinical Sciences. Finally, those visits gave me the information necessary to identify persons who might be invited to add their contributions to my Collection. In section 3 of this Foreword, entitled 'Some Innovations in Clinical Sciences',

I have used those very recent contributions in an impressionistic sketch of UCL activity on the academic side of Clinical Sciences, that can be regarded as complementary to extensive material on other 'Life Sciences' topics in my RSA Lecture. I hope to fill other gaps on future occasions.

In addition to academic matters, a Provost is deeply concerned too with UCL's financial and general administrative policy. I should like here to pay tribute to the outstanding quality of the College's administrative staff. During a session when many major readjustments to new Government initiatives, and to new University arrangements, were required they have played a vital role in ensuring that the College's responses could be made in such a way as to disturb the continuity and effectiveness of academic work only to a minimum extent. For example, the contributions of Finance Division on the detailed administration of the necessary College savings programme, of the Bursar's Department on many thorny problems of space redistribution and refurbishing, and of the Registrar's Department on crucially important overseas students matters, have been of the highest quality.

The College has the priceless advantage of help and advice from many persons of eminence who sit on our governing body, the College Council, as lay members. This Annual Report includes an extended tribute to our outgoing Chairman of Council, Sir Bernard Waley-Cohen; a tribute to which I should like to add my own words of deep gratitude for his greatly valued personal guidance and support to me ever since my appointment. The contributions of our distinguished Treasurer, Sir Francis Sandilands, in helping UCL to respond realistically in the face of all the uncertainties resulting from the Government's policies on overseas students' fees, have also been invaluable.

Since my own appointment as Provost, I have with most grateful satisfaction secured the agreement of four new persons of great distinction to accept election to the Council. We are delighted to welcome Dame Margaret Booth, a learned justice of the High Court; Mr James Mortimer, the very experienced head of ACAS (the Arbitration and Conciliation Advisory Service); and Mr John Whittley, who was Deputy Chairman of the former UCHMS Council. Finally, we give a very particular welcome to Sir Peter Matthews, the Chairman of Vickers Limited (now

Rolls Royce Vickers), who brings to us a great width of experience, and who since his original nomination to Council has been elected to succeed Sir Bernard as Chairman. His acceptance of this appointment is most encouraging to the College.

The Council and the Academic Board have given unanimous support to an active policy aimed at preserving UCL's integrity in the face of current University enquiries. They both see the College as an administratively integral and topographically compact academic institution, strong in the humanities and law, fine arts and architecture, physical sciences and engineering, life sciences and medicine. They are determined to maintain this integrity, which allows an intimate spirit of collaboration within and among all those fields on UCL's 'Half Kilometre Square'. Furthermore, they see no case for attempting to widen that organisation in ways that would change the academic balance or the topographical compactness.

On the other hand, the Council and the Academic Board are happy to encourage joint courses between UCL and other component bodies of the University of London. There are several areas within the arts and the sciences where such courses already exist. Clinical education is another field where there is great scope for mutual advantages from such co-operation. Furthermore, some of those advantages could generate financial savings from elements of 'rationalisation' which they would entail.

However, the proper conditions for unification or 'integration' to be a success (close topographical contiguity and a common history) are not present in this field of clinical education. A different road is contemplated: in fact, a Joint School of Medicine, organised in co-operation between UCL and a nearby institution of medical education as independent entities, is seen to have great potential. Similar arrangements may well be appropriate for co-operation between UCL and one or more postgraduate institutes.

The University of London offers a host of shining examples of the success of academic co-operation between its component bodies. The success stories have emerged, however, not where a rigid pattern was imposed from above but where co-operation was allowed to grow upwards from the 'grass roots'. It is, of

course, my own firm conviction about the need to pay the most careful attention to developments and innovations at the 'grass roots' that has led me to highlight many of those in my RSA Lecture and in the two supplements to it that constitute the rest of this Foreword.

## 2. *Some Innovations in the Humanities*

In the part of my 'Academic Innovation' lecture concerned with UCL's earliest years, I described the College's pioneering work in introducing completely new subject areas for university education. I ought to remark, however, that all this early pioneering accompanied a very solid body of quite traditional education in the classics under the substantial latinist T. H. Key, the respectable ancient historian George Long and the elegant Greek scholar Henry Malden.

Indeed, it was only towards the end of the nineteenth century that UCL's approach to the study of the ancient world acquired any of the specially innovative aspects that have characterised it ever since. The session 1892–93 marked a major turning-point, with the simultaneous appointments of A. E. Housman and Flinders Petrie, but a significant advance had already been made in the previous decade.

James Yates, whose 1825 publication *Thoughts on the Advancement of Academical Education in England* had strongly influenced some of the founding Council members (although his subsequent candidature for the Professorship of Greek was unsuccessful), died in 1875, leaving to UCL a reversionary interest in substantial monies to endow a Professorship of Archaeology, one of the few developments advocated in his *Thoughts* that had not yet been put into effect. The endowment materialised ten years later, after C. T. Newton, Keeper of Classical Antiquities at the British Museum, had already been appointed Professor of Archaeology in 1880. The Yates Professors from Sir Charles Newton onwards have actively maintained UCL's strong connection with the British Museum and a firm foundation in archaeology for the College's classical studies.

A benefactress, closely comparable to Yates in the valued blend of intellectual guidance and testatory munificence, was Amelia Edwards. She had travelled in Egypt and thereafter

worked to promote the study of Egyptology in England. She co-operated with R. S. Poole, Keeper of Coins in the British Museum, who in 1889 succeeded Newton at UCL as Yates Professor. With others, they established the important Egypt Exploration Fund. Later, she commented that the fact that UCL was open to women influenced her strongly in the important decision that her bequest to endow a Chair of Egyptology should be offered in the first instance to University College.

Simultaneously, she recommended to the College for the Chair a first occupant of extraordinary gifts: Flinders Petrie, appointed in 1892. Another recommendation vital to the success of the new Department was found equally appropriate: the contract of every Edwards Professor of Egyptology has laid down that the winter of each year is to be spent upon work with students in Egypt itself. This work, supported from the beginning (and still strongly supported) by the Egypt Exploration Society, rests thus upon the double beneficence of Amelia Edwards.

Petrie's work during his 40-year tenure of the Edwards Chair established him as one of the greatest of all UCL's innovators, possessing unique gifts in the discovery and effective use of both archaeological remains and written records. He accumulated one of the world's most important collections of material on which scholars in Egyptology can work. Over and above that, he personally developed an extraordinary width of grasp of his field, which ultimately allowed him to become the first person to establish a reliable chronology for the vast time span of Egypt's ancient history. One of the brief list of objectives on which UCL's 150th Anniversary Appeal is to be concentrated is described as follows:

> 'to ensure that the great Flinders Petrie collection is maintained in conditions that will ensure its long-term preservation along with proper accessibility to scholars and the public.'

In the past decade, H. S. Smith (Edwards Professor of Egyptology since 1970) has worked with his colleagues at Saqqara, 17 miles south of Cairo, in ways that have added greatly to knowledge of the history of the ancient Egyptian capital city, Memphis. There, the numerous fine pyramids had tended to concentrate earlier activity in excavation and research upon the

Old Kingdom period (2680–2160 B.C.) when Memphis was the royal residence. Professor Smith's work, by contrast, has illuminated its history thereafter, when it remained the central city for all administrative purposes.

In particular, his colleague Dr G. T. Martin has studied a great New Kingdom necropolis, neglected since the mid-nineteenth century, where he found and analysed in impressive detail the splendid tomb of Horemheb, last Pharaoh of the XVIIIth Dynasty (1335–1308 B.C.). At the same time, Professor Smith's own excavations have given invaluable new information about the cultural, economic and social life of Memphis during the reign of Psammetichos I, who in 663 B.C. liberated Egypt after centuries of foreign rule. More recent work by Professor Smith is similarly revolutionising knowledge of the Ptolemaic period.

A typically 'UCL' feature in today's Egyptology Department is Dr D. M. Dixon's comprehensive and fruitful application of the Life Sciences to Egyptological remains. For example, his six years of work with medical and other specialists has produced an immense amount of information on both diet and disease in ancient Egypt; while a detailed study of the horse in ancient Nubia has emerged from his collaboration with staff of the British Museum (Natural History).

From the outset, the Department has possessed special strength in ancient Egyptian linguistics. This is a field where there has been a continuing interaction with UCL scholars in the other ancient Near Eastern languages, and especially Hebrew.

It is worth noting here that Hebrew is a subject where University College was active, and also innovative, since its foundation. Above all, the founders of UCL used a daringly novel approach (for 1828) in filling the Professorship of Hebrew by appointing a distinguished Jewish scholar, H. Hurwitz, who taught the ancient Hebrew literature from the standpoint of Jewish culture, history and religion, rather than from a Christian standpoint. Subsequent appointments to this Chair (now the Goldsmid Professorship of Hebrew and Jewish Studies) have steadfastly maintained this valuably distinctive approach; and, furthermore, have brought about an extension of the Department's work into the study of medieval Hebrew literature, Hasidism, and the History of the Jews in Europe. The two last-named subjects represent special interests of the former Goldsmid Professor J. G. Weiss and of today's distinguished incumbent, Professor C. Abramsky.

In the meantime, the eighteen-nineties had seen the Classics in Gower Street develop at last their true distinctive strength with the beginning of Housman's nineteen years as Professor of Latin (the period of his major writings); and, also, of the even longer tenures of the Chair of Greek and the Yates Chair by A. J. Platt and E. A. Gardiner. In the Classics, as in many other fields, UCL's strength once acquired was never lost again, but rather augmented. Thus, in the nineteen-fifties we find a similar combination of O. Skutsch, T. B. L. Webster and C. M. Robertson bringing special lustre to Latin, Greek and Classical Archaeology at UCL. This lustre was further enhanced by the 1950 appointment of E. G. Turner as Professor of Papyrology in the Department of Greek. His work in the decipherment and interpretation of papyri (including those in the great Oxyrhynchus collection) discovered through the work of the Egypt Exploration Society added greatly to our textual knowledge of the work of many classical authors; and, above all, of Menander.

At the beginning of 1979–80, UCL welcomed as Eric Turner's successor Dr H. G. T. Maehler who for fifteen years had done outstanding work on papyri of both historical and literary importance from the Egyptian Museum in West Berlin. Most recently this work uncovered a Hellenistic poem which may have been the source from which Ovid and Virgil obtained their knowledge of the tragic love story of Hero and Leander. Now Dr Maehler is taking a strong interest in the Oxyrhynchus papyri; and, especially, in new material made available through the application of techniques suggested by the UCL Department of Biochemistry. These involve the demounting of papyrus cartonnage through the action of proteolytic enzymes on the original protein glues.

The extraordinary width of Professor T. B. L. Webster's approach can, perhaps, be indicated by mentioning two of his innovative activities. One was his famous collaboration with Michael Ventris, following the decipherment of the Minoan Linear B script and its effective identification with Greek. The other was his initiation of a marvellous collection (acquired from very diverse sources) of photographs of those ancient art objects which offer illustrations of Greek plays and their performers. Knowledge of the Greek theatre has been greatly extended by use of this collection. Webster's successor, Professor E. W. Handley, has played the leading part in a major inter-

national project to make the collection still more widely comprehensive and to complete its publication. Professor Handley's dual involvement in this work and in the recovery of substantial new Menander material from papyri has proved of crucial importance for the recently increased appreciation of Menander's role in the genesis of the Comedy of Manners.

Ancient History, too, flourished at UCL in the post-war period, after the distinguished appointment of A. D. Momigliano to the Chair in 1951. Later, the formidable problem of replacing him was brilliantly solved in 1976, when Fergus Millar was appointed to the UCL Professorship of Ancient History. Professor Millar combines general distinction in Roman Imperial History with a special reputation for his discoveries related to the history of the Jews during that period. Equally, he has helped to foster a valuable recent innovation in the teaching of Ancient History and the Classics at UCL, the Ancient World Degree. This is an innovation where all the staff in those fields participate, which acquires both coherence and flexibility through its combination of 'common core' material (including substantial work in a classical language, in Ancient History, in Classical Archaeology and in History of Literature) with a wide choice of 'specialisation paths.'

Earlier, in 1972, the College had welcomed to a lectureship, to be held jointly in the Anthropology Department and the History Department, Mrs Sally Humphreys, who successfully achieved another innovative objective: to design and organise a combined Degree course in Ancient History and Social Anthropology. Her own book *Anthropology and the Greeks* has been found most attractive to the students on this and other courses. Now her recent research work has further expanded this mixed field through an intricate study of the Greek kinship system, which takes new material into account and makes wide use of modern developments in anthropological kinship theory.

The UCL Department of Anthropology had acquired its present form in 1945, under the Headship of the distinguished Professor Daryll Forde; although, like many important UCL developments, this one owed much to some energetic initiatives by Sir Grafton Elliott Smith, Professor of Anatomy during 1919–36. In fact, the post-war Department, although in the Faculty of Arts, retained Elliott Smith's strong interests in Physical as well as in Social Anthropology.

The majority within the staff of the Department today is formed by the social anthropologists under the leadership of Professor Andrew Strathern. He is well known for four books analysing the composition of social groups, and the emergence of 'big-men' or leaders, in two parts of the Central Highlands of Papua New Guinea. He uncovered, as a key to understanding these phenomena, the principle that individual and group activities in those societies are largely directed towards the aim of maximising the level of exchanges of objects of material wealth between individuals. In his later work, he showed how the gradual changes in those societies are equally regulated by the operation of this principle.

Although relatively in a minority, the UCL physical anthropologists, under Dr Robert Martin's leadership, constitute the biggest British University group within that discipline. They are noted for work on the evolutionary biology of the primates (lemurs, lorises, tarsiers, monkeys, apes and man). Chromosomal studies and biochemical data are among the techniques they use to assess evolutionary relationships. The evolution of the primate brain, skull and locomotor apparatus is analysed by use of a wide range of preserved material from living and fossil primates. In many interesting cases, however, Dr Martin has shown that a key role in establishing evolutionary relationships is played by behavioural studies in the field. Work using radio-telemetry on nocturnal primates in African habitats has proved extremely fruitful in this respect.

Within the University of London, Modern and Medieval History are well known for their continued, and highly effective, use of an Intercollegiate teaching and examining system. A major role in this is played by the corresponding sections of the UCL History Department. During this century these were built up, by A. F. Pollard, Sir John Neale and Joel Hurstfield successively, to a high level of distinction within English History in general and Tudor History in particular. While emphasising the Department's continued strength within general British and European History, under its distinguished present Head, Professor D. W. J. Johnson, I shall nevertheless conclude this inevitably selective account of some innovations in the humanities by referring to three academic developments within areas of History that are somewhat special to UCL.

The contribution made to London's knowledge of its past by

Valerie Pearl, who holds the world's only Chair of London History, has been widespread both in education and research. In 1975 she convened an important meeting of scholars and experts from many fields (history, geography, sociology, architecture, planning, literature, art criticisms, etc) which led to the founding of the *London Journal*, a bi-annual publication devoted to interdisciplinary studies of the city, past and present, with Professor Pearl as Editor-in-Chief. She is equally active as a Governor of the Museum of London; which, after its recent redevelopment within purpose-built accommodation, has arguably become the finest great-city museum in the world. Students of the University of London (for example, those taking the class 'Urban History in London from 1400 to 1700' organised by Professor Pearl) benefit greatly from active contact with the Museum. In the meantime, new approaches to London History research have been opened up through Professor Pearl's comprehensive utilisation of the vast archives in the Guildhall Library and in the City Companies.

Another area of specially innovative activity within the UCL History Department is that associated with the Reader in Hispanic American and Brazilian History, Dr L. M. Bethell, who is also General Editor of the *Cambridge History of Latin America*. His close collaboration with the Department of Spanish and Latin American Studies typifies a widespread involvement of the UCL Modern Language Departments in associated historical work (a trend illustrated, too, by the appointments of distinguished historians, Professors J. R. Hale and P. G. Foote, to head the Departments of Italian and of Scandinavian Studies). One important educational product of that collaboration was the Degree Course MILARS (Modern Iberian and Latin American Regional Studies).

This is a field where great economic developments (especially in Brazil, the area of Dr Bethell's special distinction) and a rapidly changing political background (actively influenced by events such as the Cuban revolution) are intricately involved with an upsurge of impressive literary activity within Latin America. All these features make the course widely interesting to students. The latest development is that the UCL specialist in modern Latin American Literature, Nissa Torrents, has collaborated with James Leahy of the Slade School's Film Department to create a popular course option in the stimulating study of Latin American Cinema.

All of UCL's activities, whether in the humanities or in other areas, have of course been strongly influenced by the College's explicitly acknowledged debt to Jeremy Bentham's innovative contributions within the fields of philosophy, education, politics and jurisprudence. These considerations add special importance to the work of the great Bentham Project, whose principal architect has been the UCL Professor of the History of Political Thought, J. H. Burns, General Editor to the Project from 1961 to 1977, who, for two years thereafter, acted jointly with the present General Editor, Dr J. R. Dinwiddy.

The Project has two main aspects: the publication of a complete edition of Bentham's works based upon the immense mass of his manuscripts in the UCL Library; and the publication of Bentham's correspondence, based of course upon a very much wider range of sources. Already, an impressive increase in understanding of Bentham as a man has emerged from the published volumes covering his correspondence up to 1788 (when he was 40). UCL's Astor Professor of British History, I. R. Christie, has been responsible for the third volume which includes Bentham's period in, and extensive correspondence with, the Russia of Catherine the Great. The important fourth and fifth volumes covering the years of the French Revolution (edited by A. T. Milne) are shortly to appear; and four more volumes are in an advanced state of preparation. Two of these, covering Bentham's correspondence with Spain, Portugal and Latin America, are of great importance for the history of the Latin American liberation movements.

The corresponding need for a proper complete edition of Bentham's works had long been seen to derive special urgency from the fact that very few of his more substantial writings were ever published by Bentham himself. He was content, for the most part, to leave the presentation of his ideas to those (like Etienne Dumont, from Geneva) whom he called 'disciples'. One consequence of this was that the sole previous attempt at a comprehensive Bentham edition, made in the eighteen-thirties, was excessively based upon translations from Dumont's French versions. Now the great treasures in the basement of the UCL Library have been mined at last to present to scholars what Bentham actually wrote. Four of his works in jurisprudence, edited by J. H. Burns and H. L. A. Hart, have already appeared. Thirteen more volumes are now in active preparation, with

Oxford University Press taking over from the Athlone Press as the project's publisher. Scholars in many countries are participating in the editorial work. Nevertheless, this process remains centred in that College which, long ago, adopted Bentham's Auto-Icon (showing him in the attitude in which he would sit 'when engaged in thought') as the benevolent symbol of all its innovative energies.

### 3. *Some Innovations in Clinical Sciences*

In my lecture 'Academic Innovation' I told the story of the building of the new University College Hospital and its associated Medical School, and of their administrative separation from University College proper. Both events occurred in the middle of this century's first decade. Up to that time, a joint development of the clinical sciences and of the basic medical sciences at UCL had successfully generated great strength in both fields. Then both, although now separated, were enabled to develop their strengths still further by parallel benefactions from the same source: the Rockefeller Foundation, whose donations after the First World War made possible both Elliott Smith's revivification of Anatomy and also two great advances within University College Hospital and its Medical School.

One of these major new developments was the setting up of Clinical Professorial Units at UCH, to foster advanced clinical education and research; for example, in Medicine, where an already fine staff including the great cardiologist Sir Thomas Lewis was still further enhanced by the impressive new Unit under Professor T. R. Elliott. It is well known how that Unit continued to flourish and expand under his successors Sir Harold Himsworth and Lord Rosenheim. Equally, the new Unit in Surgery, under Mr C. C. Choyce (appointed Professor in 1924), had notably added to the Hospital's existing strength in Surgery built up successively by Sir Victor Horsley and Mr Wilfred Trotter. For these two Units the distinguished present Heads are, respectively, Professors O. M. Wrong and C. G. Clark.

The other main new development financed by Rockefeller generosity was the building of the Obstetric Hospital, where the great F. J. Browne was appointed in 1926 to head the Clinical Professorial Unit. Browne saw the need for thoroughgoing modernisation of both obstetric practice and obstetric education

in Britain, with the objective of bringing about a big reduction in both child-bed mortality and infant mortality. The new Obstetric Hospital and Unit became, in Browne's hands, powerful tools for achieving these ends. Besides his marvellous pioneering work on ante-natal care, and his introduction to London of the famous emergency obstetric 'Flying Squad', F. J. Browne also became one of Gower Street's giants of Academic Innovation by his insistence upon Obstetrics and Gynaecology as one of the major components in the education of every medical student. The Unit's comprehensive pioneering work was splendidly continued by his successor Professor W. C. W. Nixon who instituted the first contraceptive clinic in any Teaching Hospital and, also, introduced that subject into the undergraduate curriculum.

Our reunited College can feel a special pride in the continued pre-eminence and pioneering work of its present Department of Obstetrics and Gynaecology under Professor D. V. I. Fairweather. In obstetrics, its clinical, educational and research work has been further strengthened through particular developments in the Department of Paediatrics under Professor L. B. Strang and Professor E. O. Reynolds, these being developments directed especially towards the care of the new-born.

Within these areas, one or two examples of recent innovations may be selected, somewhat at random, for summarisation. Professor Fairweather and his colleagues pioneered mid-term fetal blood sampling in Britain, using the two alternative techniques of fetoscopy and placentacentesis. Where grounds exist for suspecting the possibility of a haemoglobinopathy in the fetus, this approach to a mid-term diagnosis may be of great value: in the majority of cases it proves, to the parents' great relief, that the abnormality is not present, while it allows for termination of pregnancy to be considered in cases where a serious abnormality is proved to be present. The service has been developed to a particularly high level of effectiveness and reliability in the hands of Dr Bernadette Modell for the serious deficiency disorder of the haemoglobin chain known as beta-thalassaemia, which leads to lethally severe anaemia in early childhood.

Professor Strang has greatly advanced knowledge of fetal lung liquid; that is, of the liquid which fills the fetal lung so as to keep it expanded and significantly to facilitate its development.

He proved that an active pumping of chloride ions is responsible for the formation of the fetal lung liquid, which in turn is one of the important sources of the amniotic fluid. More recently, he demonstrated that the process of absorption of fetal lung liquid which needs to precede the new-born infant's first breath depends upon an active process triggered by beta-adrenergic receptors responding to adrenaline in the blood stream. It is important, incidentally, that the creation of a large new fluid-air interface when the lungs are expanded in that first breath is facilitated by the surfactant protein which is one major component of fetal lung liquid.

A mid-term diagnostic technique alternative to those mentioned earlier is amniocentesis; this involves withdrawal not of fetal blood but of amniotic fluid. An early amniocentesis may affect the combined volume of amniotic fluid and fetal lung liquid, either through direct removal or through continual leakage thereafter. The possibility of a resulting restriction in fetal lung development was postulated by Professor Fairweather in 1976. Since then, confirmatory evidence has emerged from two sources: (i) a massive study commissioned by M.R.C., which showed a statistically significant increase of unexplained respiratory difficulties in newborn infants from mothers where early amniocentesis had been performed; (ii) work by Professor Fairweather and his colleague Dr Alison Hislop in Macaque monkeys demonstrating a reduction in the total numbers of respiratory airway branches, and also of alveoli, in the lungs of delivered offspring where an early amniocentesis had been performed.

Within the field of Medicine proper, Sir Thomas Lewis had been succeeded in 1946 by Sir Edward Pochin, whose many areas of innovative work included extensive developments in the clinical application of new discoveries from physics; for example, in the use of radio-active iodine and other radio-isotopes. The spirit of this work is continued today in many parts of the Faculty of Clinical Sciences, but especially within the Department of Medical Physics under Mr J. S. Clifton. The Department is involved in the development of a wide range of imaging processes including advanced applications of radio-isotopes, of ultrasound and of computerised tomography; this last area is one where Sir Jules Thorn's generosity has made the Faculty particularly well equipped.

It may be of interest to note, too, one quite different area of that Department's work. In connection with the management of newborn babies suffering from respiratory illnesses, its development of instruments for continuous measurement of arterial-blood oxygen concentration (required as an input for the safe control of respirators) has aroused very widespread interest. The first such development (a special electrode incorporated in the tip of a catheter) is now marketed successfully in the UK and USA by G. D. Searle and Company Limited. The most recent prototype development for the same purpose is non-invasive, operating with good accuracy by means of a single electrochemical sensor maintained at 44°C and attached to the skin; this, too, appears highly promising.

Another special post-war growing point within Medicine proper was the Professorial Unit created for Charles Dent in the field of Human Metabolism. It was in 1944 that, applying the new techniques of paper chromatography which Martin and Synge had just discovered, he began his remarkable researches on disorders of amino-acid metabolism. Gradually, Dent built up a large and active team engaged in clinical research covering an even wider range of metabolic disorders. This team acquired high international distinction. Today, under his successor Professor Richard Edwards, a still bigger group is devoted to the treatment of such disorders, and to education and research in human metabolism, in two specially suitable premises: the Charles Dent Metabolic Unit within University College Hospital, and a part of the splendid Rayne Institute, built as a result of Lord Rayne's generosity to house much of the research work of what is now the UCL Faculty of Clinical Sciences.

While the earlier work, especially on behalf of patients with congenital metabolic disorders, has been actively continued, notably by Dr D. P. Brenton and Dr D. C. Cusworth, the work in Human Metabolism has been extended by Professor Edwards to include major studies of mechanisms of muscle fatigue. This work includes a valuable collaboration with Professor Patrick Wall of the Department of Anatomy on the factors underlying ischaemic muscle pain. Professor Edwards's researches have a large range of clinical application, especially to patients with muscular dystrophy and other metabolic myopathies.

Even during their period of administrative separation, UCHMS and University College remained linked together through their

many common scientific interests and a shared concern for the medical education of Gower Street students. Yet another strong 'chemical bond' between the two educational institutions was associated (like other such bonds) with a 'shared electron': Desmond Laurence, who has held appointments on both sides of Gower Street since he became Reader in Applied Pharmacology in 1954. Ten years later he was appointed to a Professorship (still on both sides) and holds it now as the Head of Clinical Pharmacology in the Faculty of Clinical Sciences and also as a professorial member of the Department of Pharmacology in the Faculty of Medical Sciences.

For this Annual Report, a suitable single illustration of major innovative work within the Department of Clinical Pharmacology is given by those achievements of Dr B. N. C. Prichard that led to conferment of a University Professorship on him, too, as from 1 April 1980. The drugs that block the action of beta-adrenergic receptors were discovered many years ago by UCL's former Pharmacology Professor J. W. Black, F.R.S., and one major area of their application is to cardiovascular disease. It has, however, been above all the extensive programme of work by Dr Prichard on clinical trials, based on meticulous pharmacodynamic measurements in dose-response studies, that has proved necessary for the development of sound therapeutic regimens for certain important cardiovascular disorders. These have included, especially, arterial hypertension and, more recently, angina pectoris.

Both in the education of medical students and in the essential service functions of a Hospital, as well as in a wide range of clinical research, a vital role is played by Departments concerned with different aspects of pathology; that is, with histopathology (or Morbid Anatomy), bacteriology, virology, biochemical pathology, haematology and so on. These too have been areas where UCH has shone, through outstanding professorial appointments like those of Roy Cameron, Wilson Smith and C. Rimington. Their distinguished successors today include Professors J. F. Smith, K. R. Rees and E. R. Huehns.

A new development in this area, begun in 1967, acquired the name Department of Experimental Pathology. This Department, under Professor J. D. Judah, is primarily devoted to research work on the mechanisms of, and the disorders of, the secretory process.

One major result of Professor Judah's work was the discovery of proalbumin. An investigation of the toxic action of ethionine on the livers of female rats showed that it produces a drastic reduction in protein synthesis by lowering the level of ATP in liver cells, so as to paralyse the active sodium-ion pump (which in the female rat has a disadvantageously lower affinity for ATP than in the male). It was in the study of how the resulting fall in potassium-ion concentration greatly reduces the biosynthesis and transport of serum albumin that Professor Judah and his colleagues discovered that protein's precursor, proalbumin; using labelling techniques to demonstrate that it was the species transported through the liver, being converted to albumin just before secretion within the vesicles of the Golgi apparatus.

Today's Professorial Unit in Surgery, under Professor C. G. Clark, enjoys exceptional distinction in gastro-intestinal surgery. At the same time, some of the specially valued innovations in the Unit have been aimed at reducing the number of those cases for which surgery is necessary.

Professors Clark and Wyllie, with other members of the Unit, have played a leading role in establishing the usefulness of cimetidine in the treatment of duodenal and gastric ulceration. Cimetidine (another of Professor J. W. Black's discoveries) is the best known antagonist for what are known as the histamine $H_2$ receptors; broadly speaking, those receptors whose action in stimulating histamine secretion is not blocked by the classical anti-histamine drugs. Four years' work in the Unit, investigating its effects in experimental animals and healthy human subjects, culminated in the first demonstration of the effectiveness of cimetidine on patients with duodenal ulcers, reported in 1976. The Unit then participated in a double-blind multi-centre trial involving 200 patients. This and other trials established widespread confidence in the treatment. Today, it is no exaggeration to claim that the frequency of operations for duodenal ulcer has fallen substantially in centres where this drug is employed.

Optical fibres, alongside their ubiquitous use for endoscopy (including visual observation of tissues within the gastro-intestinal tract) have also another potential role as a means of treatment. The Surgical Unit is one of the major groups carrying out controlled trials which are indicating the value of Argon ion laser pulses (operating at 8 watts) for coagulating bleeding areas in the gastro-intestinal tract. The laser pulse is passed along a

thin quartz fibre within a catheter of 2.8 mm diameter that includes also endoscopic fibres and a jet of $CO_2$ gas. This is directed on to the lesion to blow blood away before a laser pulse of the correct total duration is applied. Although this work, in which Dr P. R. Salmon and Dr M. Sarner are playing a leading part, has not yet fully established the precise future role of this form of treatment, the indications are that it will become recognised as one valuable weapon for controlling acute alimentary haemorrhage, which currently accounts for around 30,000 hospital admissions a year in the UK alone.

In parallel with about 100 medical students who enter each year upon their clinical education at University College, there are 50 dental students. The National Dental Hospital in Great Portland Street had become incorporated within University College Hospital in 1914, after which an annual intake of 25 dental students was trained at the College, the Hospital and the Medical School. However, a major expansion to 50 students became feasible after the erection of UCH's splendid new Dental Hospital in Mortimer Market in 1963. Today, one of the jewels of UCL's Faculty of Clinical Sciences is the Dental School with its five distinguished Professors (including the Dean of the Faculty, Professor A. S. Prophet) and about forty other academic and consulting staff members, under the Headship of Professor A. G. Alexander.

Selecting for the present brief sketch of the Faculty one of many important areas of innovation within the Dental School, I am inclined to emphasise a flourishing body of research on mechanisms of tooth support centred within the Rayne Institute. This work by Professor D. C. A. Picton and his colleagues is concerned with the manner in which the supporting connective tissue (the periodontal ligament) functions when biting force is applied to a tooth. The research uses sensitive displacement transducers that can detect changes in position of a tooth relative to the adjacent bone within a range from 0.5 to 100 micrometres, and can also detect those distortions of the socket which occur when the biting force exceeds about 0.5 newton. Unravelling the complex biomechanical properties of a network of collagen fibres intertwined with the ramifications of a vascular net has greatly enhanced understanding of how substantial fluid displacements play a role in cushioning biting forces; as well as of how their effectiveness is limited in prolonged tooth grinding

or clenching. A major tool in the work is the scanning electron microscope, used upon replicas from silicone-rubber impressions of the ligament surface in a living monkey to study how that surface changes under different loading conditions. This work co-exists with equally important parallel work on the mechanisms of those much longer-term positional changes in teeth for which action of the periodontal ligament is also responsible.

Another specialist Hospital that became a valuable addition to the UCH complex was the Royal Ear Hospital in Huntley Street, built in 1927 as a result of the generosity of Mr Geoffrey Duveen. Distinguished consultants in the Royal Ear Hospital, working under the direction of Mr Graham Fraser, are responsible for the oto-rhinolaryngological training of the UCL medical students. They and the College welcome the possibilities, now being studied, of future close co-operation with the Institute of Laryngology and Otology in Gray's Inn Road.

Actually, one Department in the UCL Faculty of Arts shares a deep involvement in clinical aspects of laryngology and otology; specifically, those concerned with defects of speech and hearing. This is the Department of Phonetics and Linguistics, where the fine work of the former Experimental Phonetics Professor D. B. Fry has been splendidly carried on by his successor, Professor A. J. Fourcin.

Professor Fourcin's invention of the electro-laryngograph has transformed many aspects of work for patients with severe impairment of hearing. Especially, it has allowed children with profound congenital deafness to be taught voicing and intonation; in other words, that control of pitch and level of excitation of the vocal folds within the larynx which normal children develop by hearing their own voice production. The electro-laryngograph (deriving its information simply from the electrical measurement of vocal fold closure) presents to a deaf child a visual pattern corresponding to the voice pitch pattern. This has proved to be an invaluable tool in speech training.

The work just described is but one element in the Department's broadly based quantitative approach to the treatment and analysis of disorders in speech and hearing. All this, on the initiative of Professor Fourcin and his colleagues, has now produced a most important educational result: a Speech Sciences Degree based upon UCL, with major course contributions from

the Faculties of Arts, Science and Medical Sciences and a clinical-training input from the National Hospitals College of Speech Sciences.

There is, in addition, one other recent development of major clinical importance within a different part of UCL from the Faculty of Clinical Sciences. This is the work of the fine group under Dr R. M. Davies, based at Roehampton, and engaged in research and development on limb prostheses and on orthotic devices and procedures. During 1979–80, University College London was happy to come to a satisfactory agreement with the Department of Health and Social Security that this group, then part of DHSS under the name Biomechanical Research and Development Unit, would become part of UCL on 1 October 1980. It had long worked closely with Professor T. H. Lambert and other members of staff of the Department of Mechanical Engineering (within which Dr Davies was a Visiting Professor). It is now re-named the Bioengineering Centre of UCL's Department of Mechanical Engineering, and continues under the direction of Dr Davies.

The Centre's well-integrated engineering, medical and other staff have been responsible for several important innovations. One of these is a radically new approach to limb prosthesis offering several advantages to amputees, including remarkable lightness and strength and greatly reduced delivery times. The prosthesis is produced in polypropylene (or other thermoplastic material) by a specially developed vacuum forming process; and, during 3 years' experience in 100 patients, there have been no medical or other counter-indications and no structural failures.

The incorporation of this important area of clinical research and development within University College is a welcome and timely sequel to the historic reunification process through which the Faculty of Clinical Sciences has become incorporated within UCL. To conclude my impressionistic sketch of that Faculty's work, and of related matters, I should like to express the College's warmest thanks to all those who have been instrumental in allowing our greatly desired reunification process to proceed so successfully, and so smoothly, during 1979–80.

October 1980 JAMES LIGHTHILL, *Provost*

## SIR BERNARD WALEY-COHEN, Bt

*Member of Finance Committee, 1953*

*Member of College Committee, 1955*

*Treasurer, 1962*

*Honorary Fellow of the College, 1963*

*Chairman of College Committee and Council, October 1971 – September 1980*

On the occasion of a reception given on 24 June 1980 to mark the retirement of Sir Bernard Waley-Cohen as Chairman of Council, Professor Harold Billett spoke as follows:

In many ways, bidding a formal farewell to our good friend, the Chairman of Council, Sir Bernard Waley-Cohen, is much more than that – it is to turn over a page in the interwoven history of his family and the College – a history that spans 147 of our 152 years.

Hale Bellot, the College's early historian, in selecting famous names from the first Register records the arrival in 1833 to read Political Economy of Jacob Waley, Bernard's great grandfather. He must have made good because in 1842, when Fellowships of UCL were introduced to honour distinguished former students, the first three included the Quain of our Quain chairs and that same Jacob Waley. Political Economy ceased to be taught in the 1840s but was revived when Waley offered in 1854 to give a course of lectures, which were so good that he was appointed Professor of Political Economy, a post he held with a thriving law practice. Bernard's kinsfolk, the Goldsmids, held the Treasurership and various academic offices from the 1840s to the 1890s.

Bernard's father, Sir Robert, served from 1932 until his death in 1952 as a member of the College Committee, from 1944 as its Vice-Chairman and from 1938 as Chairman of the Managing Committee. He refused the Chairmanship in 1947 because he thought he was too old but was Acting Chairman until 1949. He led a well-ordered, close family and our first record of Bernard – a newspaper cutting of doubtful validity – mentions week-ends organised with near military precision. Bernard, charged to bring vital supplies to London for one such week-end, descended at Reading Station to buy a paper and lost the lot when

prevented by a policeman from rejoining the moving train. He father is said to have commented with commendable restraint 'Silly fellow – fancy not being able to fight a railway policeman'.

We know that Bernard is not a 'silly fellow' and that he has fought and won many battles on our behalf since in 1953, the same year that his close kinsman, Lord Cohen, became Chairman of the College Committee, Mr Alderman Waley-Cohen became a lay and very expert member of our Finance Committee. Two years later he began his 25 years of service on the College Committee and Council. In 1962, as his kinsman left the Chair, he began eight years sterling service as Treasurer of the College and was then Vice-Chairman for one year before he began his ten years stint as our Chairman in 1971. Curiously, his period as an Officer of the College coincides with my own association with College Committee and then Council; so, having given you the potted history I can speak from personal experience of the Lord Mayor of London who turned back to Gower Street and has dedicated so much of the last twenty years to this College and to us.

As a UC engineer I know that our excellent New Building in Torrington Place is there because of the efforts of the fund-raising committee which Bernard chaired on our behalf. £300,000 in 1959–60 is worth, I am told, £1,536,511.155 today, and without that initial boost the UGC and Mullard would not then have been moved to produce the remaining finance to allow us to finish that fine building. The College recognised that successful outcome, together with his work on Finance Committee and his outstanding success in City and national affairs, with an Honorary Fellowship in 1963.

Sir Bernard represented the College on Senate and served the Court of the University from the 1960s until 1978. His experience of financial affairs has been invaluable to us all. But of course it is Bernard's period as Chairman of the College Committee and more recently of Council that has made him widely known to the College community at large and has made his dedication to our well-being so obvious. A glance at Bernard's and Joyce's entries in *Who's Who* indicates their vast range of activities and yet they have always been anxious to play their part in our functions. It has always been a pleasure to us to see them so obviously enjoying themselves here and in the University – especially among the students. Sir Bernard is in fact a

most tolerant Chairman. I recall, as a rather nervous Acting Provost, that I embarked on that part of the Council Agenda starting around Item 2 which is introduced by the Provost and some time later felt a gentle tug at my coat from an amused Bernard as I was sailing through Item 15 having pinched about half of his job. I can assure you that his wise and kindly advice has always been readily available to us whether he was in London or his beloved Somerset.

Normally his period of office would have ended last year and it is entirely typical of his dedication to the College first, that he offered to stay on as Chairman for the first year of Sir James Lighthill's Provostship and, secondly, that when I took the usual soundings there was a unanimous view in Council and in College that he should be asked to do so.

Sir Bernard and Lady Waley-Cohen: we shall miss you in a formal sense but we know that you will always feel welcome in our midst.

Mr Alderman Sir Bernard Waley-Cohen: as a memento of this occasion and to wish you well for the future for all you have done for us, we ask you to accept this book signed by our distinguished Honorary Fellow Queen Elizabeth the Queen Mother, the Chancellor, and by many of your friends, including your fellow Fellows, in the College and the University.

## HAROLD BILLETT

*Professor of Mechanical Engineering, 1965–80*

*Dean of the Faculty of Engineering, 1969–71*

*Vice-Provost, 1973–78 and 1979–80*

*Acting Provost, 1978–79*

On the occasion of his presentation of Professor Billett as a new Honorary Fellow, on 12 May 1980, the Provost spoke as follows:

Now I come to those who, although not former students of University College, have rendered the College such exceptionally valuable services that they have been appointed to that select band, limited in number to a maximum of 25, whom we respectfully designate as Honorary Fellows. In this context it is a pleasure for me to identify first and foremost a person who for more than one reason stands out as a completely ideal choice for the Honorary Fellowship; ideal already for his long service, as a member of staff since 1946 and as a Professor of Mechanical Engineering since 1965; ideal for his devoted work as a Vice-Provost since 1973; ideal for his exceptional proven gifts exercised in planning the development of the fabric of the College as Chairman of Planning and Buildings Committee (as well as through various other committee chairmanships). All of this by itself would make already a compelling case for the Honorary Fellowship.

Yet we all know that Harold Billett earned that coveted title all over again last year, both through his unselfish willingness to accept, at very short notice indeed, the invitation to fill a certain distinctly hot seat during the session 1978–79 *and* through the outstanding ability and triumphant distinction with which, to general acclaim, he occupied that seat.

There is no doubt that future historians of the College will look back on the Acting Provostship of Harold Billett as a session of the greatest importance in the College's development. In support of that I could list an extensive range of decisions of high significance that were made during that year, covering fields as diverse as classics and physiology . . . I could refer to new developments in administrative machinery, or to the outstanding success of the 150th Anniversary Celebrations.

But, from my own immediately parochial standpoint in the Provost's Office, I want to express especially heartfelt thanks for all the tireless work and cordial co-operation that Harold Billett put into helping his successor gradually get to know the College and its ways *and* a wide range of its problems. No-one could have been more considerate to a newcomer; and I know that every one of those many students and members of staff who have been similarly helped during the past 34 years would echo in the most positive terms my references to the wonderful considerateness of Harold Billett towards all those with whom he deals.

Conscious that I have in no way exhausted the riches at my disposal in presenting the case for an Honorary Fellowship, I do so in the fullest confidence that it will be unanimously welcomed.

Professor T. H. Lambert, Head of the Department of Mechanical Engineering, adds:

In 1946 the Mechanical Engineering Department was about a quarter of its present size and Harold Billett had to become something of a 'jack of all trades', teaching thermodynamics, fluid mechanics and metallurgy. As the Department grew he was able to concentrate and become a 'master' of thermodynamics, one of the cornerstones of mechanical engineering.

During the growth of the Department Harold emerged as the wise counsellor to whom three successive Heads turned for advice and occasionally correction. He played a major part in the planning and equipping of the new Engineering Building in the late fifties. Never parochial in his approach, Harold made major contributions to the Engineering Faculty both within the College and in the wider context of London University. Thus he displayed within engineering those attributes which have made him an outstanding Vice-Provost.

Despite his immense influence on the development of the Department and the command of his own field, H. B. will not only be remembered for these qualities. The staff will remember him as a true friend, always willing to exert himself on their behalf. Countless students will always remember him as a dedicated teacher who was ever willing to find time to help them with a seemingly intractable problem in thermodynamics or some equally difficult personal problem. It is perhaps a measure of Harold's love of teaching that in 1978 he only reluctantly accepted that he would be unable to carry on his normal teaching while holding the fort as Acting Provost.

*Portrait of Lord Annan*

When Noël Annan, Provost of University College since 1966, was elected Vice-Chancellor of the University of London in September 1978 the College commissioned a portrait of him by Rodrigo Moynihan, Fellow of the College and an old friend. At a reception in the Housman Room last December for members of the Council, staff, students and Fellows who had contributed to the fund, the Chairman of Council, in Lord Annan's presence, accepted the painting on behalf of the College. The Friends of University College also have donated a very generous sum. This fine portrait hangs in the Old Refectory, having been granted leave of absence to appear before a wider public at the Royal Academy's Summer Exhibition this year.

*Finances*

Once more the year opened in considerable financial uncertainty. Early in the academic year, although no firm assessment of the likely level of recurrent grant could be made, indications were that the College's recurrent grant from the University Grants Committee was not likely to match all commitments. It was therefore agreed, with the full understanding of Heads of Departments and Deans, to seek additional savings of the order of £½ million per annum or approximately three per cent of the College's recurrent grant, to be effective by the end of 1979–80. Fortunately this situation had been anticipated and savings planned in advance were able to contribute a substantial element. Certain improvements of a non-academic nature had to be deferred.

Subsequent announcements of grant from the University Court have confirmed that the action taken last autumn was correct.

So we enter 1980–81 with our commitments considerably but unavoidably reduced. Modest last minute supplementation in July 1980 allowed some much needed 'one-off' relief to Departmental Recurrent Grants and the Library but, in common with all universities, a new threat to our resources developed during the year. The Government's intention to charge full

economic fees to overseas students with effect from 1980–81 is a matter for universal academic and financial concern. While we are confident that the College is better placed than most to continue to attract overseas students, some £2½ million per annum will be dependent on this issue. That apart, the Government claims that it will maintain 1980–81 grants at a level commensurate with 1979–80 activity, although much depends on the level of pay awards and inflation in relation to the assumptions contained in those grants. Nevertheless, the College will face these uncertainties in the confidence that the final outturn for 1979–80 shows that commitments and resources are properly matched.

The income in 1979–80 amounted to £29,373,075, an increase of £6,746,280 over 1978–79. Expenditure in 1979–80 was £29,030,168, inclusive of the cost of research borne by outside grants which total £5,616,224 compared with £4,153,573 in 1978–79. The number of these grants was 575 (561 in 1978–79). Capital Grants announced for the year amounted to £241,407 compared with £513,708 for the previous year. Receipts against these and previous Capital Grants and Capital Expenditure amounted to £239,935 compared with £395,045 in 1978–79.

1980–81 will be the first complete financial year following the Medical School's reunification with the College. The new Faculty of Clinical Sciences will continue to receive earmarked Court Grants during next year, which it enters in a financial position similar to that described for the rest of the College. The deficit for 1979–80 was £62,967 compared with the 1978–79 deficit of £32,915.

*Academic Development*

In October 1979 the University Grants Committee requested information for a forward planning exercise on student numbers and recurrent grant allocations for the period 1979–84. They indicated that total recurrent grants would be held for a number of years at a level no higher in real terms than in 1979–80. At the same time they gave notice of the Government's plan to move towards a position in which overseas students would meet the full cost of their education. The UGC suggested three possible scenarios: the implications of two of these were to

maintain constant student numbers and level funding while the third implied a severe programme of cuts. It was obvious that the Government had no intention of providing additional money to cope with the increased numbers of home students expected up to 1984 as a result of an increase in the birth-rate. Further, the maximum staff-student load had already been reached in many Departments.

The Provost was invited to visit the University Grants Committee to discuss the College's response to the planning exercise with the Chairman and Officers of the UGC. He pointed out that the College was faced with a serious financial shortfall, a situation at odds with the view that an institution with such academic strength should be given adequate supporting funds. The Provost took the opportunity to remind the UGC of the academic damage sustained through failure to proceed with building developments intended to unite the preclinical departments of the Royal Free Hospital School of Medicine with the College, the culmination of ten years of uncertainty inhibiting any major development on the Rectangle.

Barely had the assessment of the UGC planning exercise begun than the Government announced its intention to charge the full economic fee for overseas students starting courses from the beginning of the session 1980–81. With the greatest reluctance the College decided that it has no option but to increase fees for overseas students to the new minimum levels recommended by the Department of Education and Science: Arts £2,000 per annum, Science, Engineering and Architecture £3,000 per annum and Clinical Medicine £5,000 per annum, for both undergraduate and postgraduate courses. When the Provost visited the UGC he rejected a suggestion that more than the minimum be charged, on the grounds that this would result in far fewer overseas students and a correspondingly reduced income. In assessing the College's recurrent grant needs, the UGC will reduce its allocation of funds *pro rata* to the anticipated income from fees. Although this in itself represents no change from current practice, the enormous increase in fees makes the numbers of overseas students coming to the College uncertain. There can be no question of making up a shortfall of overseas students with additional home-based entrants, for whom no additional grant resources will be forthcoming. The College has therefore adapted to the situation by pursuing a

more active recruitment policy for overseas students whilst ensuring that academic standards are maintained.

In March the University announced the establishment of a Committee on Academic Organisation under the chairmanship of Sir Peter Swinnerton-Dyer (Vice-Chancellor of the University of Cambridge) with the task of considering in broad terms what re-deployment of resources for non-medical studies within the University should be adopted in order to maintain academic excellence in teaching and research. The Committee has already begun its work by inviting evidence from Schools of the University based upon a number of questions referring to their academic activities and specialisms, proposed academic developments, an indication of academic strengths and weaknesses and comments on the University's centrally funded bodies. The College has, in essence, taken the view that there is considerable merit in leaving the College basically unchanged with balance undisturbed. In any case, the recent addition of the Faculty of Clinical Sciences (formerly University College Hospital Medical School), taken with developments proposed by the Flowers Committee (referred to later in this Report), will profoundly affect the College in the area of medical education. Although the College takes a cautious view of the possibilities of rationalization within the University, it nonetheless strongly underwrites the formal and informal co-operative arrangements which exist between Departments in the College and many other Schools of the University and urges that these should be encouraged in every possible way.

*The new School of Medicine*

On 1 April 1980 University College Hospital Medical School formed the Faculty of Clinical Sciences and became associated with the Faculty of Medical Sciences in The School of Medicine, University College London. The reunification of the School with the College came about through the enactment of the University College London Bill which received Royal Assent on 20 December 1979, a cause of pleasure and relief to all those who had planned the enterprise and nursed the legislation through changes of fortune in the preceding year. An Order of the Privy Council, also effective from 1 April, amended the Statutes made under the Charter granted to the College in 1977.

These changes have provided for the representation of clinical interests in the College's committee structure. The College has been delighted to welcome all members of the School to the community. It looks forward to developing the long-standing relationship with University College Hospital and carrying on the fine traditions of medical teaching and research begun in Gower Street over 150 years ago.

*The Flowers Report and the College Response*

The Working Party on Medical and Dental Teaching Resources under the chairmanship of Lord Flowers presented its Report *London Medical Education – a New Framework* in February 1980 in parallel with a discussion document issued by the London Health Planning Consortium entitled *Towards a Balance: a framework for acute hospital services in London reconciling service with teaching needs*. The College was invited to comment on the substance of the main recommendations of the Report and in doing so endorsed in general terms the proposals as they affected the College. In particular, the College welcomed the Working Party's recognition of University College (since the reunification of University College Hospital Medical School) as providing an ideal framework for preclinical and clinical medical and dental education and stressed the advantages foreseen in close co-operation with the Middlesex Hospital Medical School. The response outlined proposals for interim administrative arrangements that could jointly develop in the medium term with the Middlesex Hospital Medical School and did not exclude the possibility that the Royal Free Hospital School of Medicine might also come to be associated in the longer term. The College also foresaw advantages in co-operation with some of those Institutes of the British Postgraduate Medical Federation which the Report proposed should be more closely associated with University College. The College welcomed the proposed link with the London School of Hygiene and Tropical Medicine as further strengthening existing collaborative arrangements offering considerable scope for development.

*College Sites and Buildings*

A dramatic change in the outward appearance of the College during the last year has been effected by the stone-cleaning in the Front Quadrangle. The result has been praised by most visitors to the College who remember the buildings' former blackened state. After the dirt was removed, the stonework was found to be in good condition. No attempt was made to replace mouldings affected by erosion, but essential repointing and repairs have been carried out to reduce further deterioration. Unfortunately the Quadrangle is not yet free of scaffolding as a routine inspection has discovered serious defects in two of the original eighty-feet long pine trusses over the portico and the repair of these is now in hand.

In common with other universities, there are no major capital projects to report. But in the hope of funds from the College's Appeal some preliminary design work has been commissioned on four schemes. All of these will be described and some illustrated in the Appeal brochure. They offer the best hopes for a substantial physical improvement of the College.

Meanwhile, efforts are concentrated on modernising and adapting the existing stock of buildings and on energy conservation measures. The Council and Committee Rooms were overhauled and redecorated in time for the beginning of the session with financial help from the Friends. Alteration and refurbishing schemes in hand include work in Foster Court for the Department of English and the College Administration, and in the Old Chemistry Building for Micropalaeontology. Part of Wolfson House is being converted to provide laboratory facilities for the new Speech Sciences course, referred to later in this Report. The biggest scheme of all is the complete overhaul of Campbell Hall in Taviton Street to produce a self-catering residence for 125 students by October 1980 – a further College contribution to the preservation of a surviving Bloomsbury terrace.

*Staffing Matters*

The year 1979–80 will be remembered in the Personnel Section as the year of comparability, reunification and removal. Salary negotiations in universities as well as in other branches of the

public service have been subject to examination by the Standing Commission on Pay Comparability (the Clegg Commission). This year has therefore seen an unprecedented number of interim pay awards resulting from various national negotiations, all pending the outcome of Professor Clegg's examination of the various groups. Uncertainty about pay awards coincided with the complex exercise of assimilation of staff from University College Hospital Medical School consequent upon its reunification with the College. The year also saw the introduction of Disciplinary and Dismissal Procedures for all categories of non-teaching staff; the extension of the development programme for Probationary Lecturers; and the enlarging of the centralised training scheme for mechanical and electronic workshop technicians. The busy academic year for the staff of the Section ended on a domestic note early in the long vacation when they finally moved to new accommodation on the second floor of Foster Court, thus ending a seven year old separation of part of the Section and providing better accommodation for the whole staff to carry out their functions.

*Student Numbers*

On 31 December 1979, 6,155 students were registered at the College. Of these, 4,241 were full-time undergraduates, of whom 1,550 were newly admitted to first degree courses, showing an increase of 35 over the equivalent figure in the Annual Report of 1978–79.

The total postgraduate student population on the day of count was 1,742, compared with 1,734 in the previous year. 1,321 students were studying on a full-time basis, 421 part-time. Of the full-time postgraduate 57 per cent were undertaking research; the corresponding figure for part-time students was 70 per cent.

The College has continued to attract students from many overseas countries, though the number may decline owing to the financial climate and increases in fees. However, just over one-sixth of the full-time student population was from overseas -- 318 students were normally resident in 28 Commonwealth countries and 634 students from countries other than the Commonwealth. Of the students from overseas, 535 were studying on a full-time basis at postgraduate level.

37 per cent of the full-time undergraduate students in attendance at the College were living in halls of residence or other accommodation provided by the College or the University and 21 per cent lived at home; the remainder were in lodgings or flats.

Student numbers at University College Hospital Medical School on 31 December 1979 were 487 undergraduates, all full-time, and 59 postgraduates of whom 37 were full-time.

During the session three new undergraduate courses were introduced; the combined studies B.Sc. Degree in Mathematics and Astronomy, the four year B.Sc. in Speech Sciences and the B.A. Degree in Spanish with French.

At postgraduate level the Diploma in Egyptology and the Diploma in Film Studies were discontinued.

*Academic Matters*

In March the College and the local Association of the Association of University Teachers jointly organised a visit to the College by Members of Parliament, inviting particularly Members from constituencies in the London area. In the event nine MPs attended. Each saw two out of fifteen projects of especial national significance. They were subsequently entertained to lunch by the Provost. It is proposed to organise similar occasions in the future as part of a continuing policy of demonstrating to Parliament the important work being carried on in universities generally and in University College in particular.

The College received a visit from the UGC Arts Sub-Committee in May. The prime purpose was to review the needs of teaching and research at the College and to consider any special problems that the College might be facing. The professors, non-professorial staff and the students in the Faculty of Arts all gave evidence and presented papers to the Sub-Committee. At their concluding meeting with the Provost the Sub-Committee expressed general satisfaction with developments but indicated the possible need to review resources provided for the Library. The College was already aware of this and steps are being taken to review Library financing.

The College's commitment to the development of Speech Sciences within the Department of Phonetics and Linguistics, in association with the National Hospitals College, is already

bearing fruit. There was an initial intake of 47 undergraduates to the four-year course for the new B.Sc. Degree in Speech Sciences in 1979; from 1980 the annual target intake will be 60. In October 1979 the University offered the College earmarked grants of £55,000 in 1980–81 and £103,000 in 1981–82 which the College proposes to devote to strengthening teaching for the Speech Sciences course through additional lectureships, technical staff posts and associated departmental expenses distributed among the Departments of Phonetics and Linguistics, Psychology, Anatomy and Physiology. Further, the College was delighted to learn that the Wolfson Foundation had most generously promised a capital grant of £55,000 in aid of building conversions in Wolfson House where part of the accommodation for the Speech Sciences course is to be provided; a contract for this work began in July 1980.

The Academic Board set up a sub-committee to consider and report on a proposal that the Department of Statistics and Computer Science be divided into separate Departments. The Department had had the title of Computer Science added in October 1971 in consequence of the establishment of a Chair of Computer Science with the aid of funds from IBM and plans to develop Computer Science teaching, followed in 1973–74 by transfer to the College of some staff of the University's former Institute of Computer Science. It gradually became clear that the two disciplines are less directly related than had earlier been thought, although both use computing techniques, so the sub-committee's recommendation that the joint Department should be separated into its component parts from January 1980 has been generally welcomed. The new Departments of Statistical Science and Computer Science are paying particular attention to the structure of, and recruitment for, undergraduate courses and are collaborating in relation to use of equipment and mutual service teaching. Both continue to occupy accommodation in the Pearson Building.

There have for some years been two, latterly three, committees concerned with the Computer Centre: a Board of Management, a Computer Committee and a Computer Policy Committee. The Board of Management has felt that the changing role of the Computer Centre within the University Computing Service and the increasing dependence of the College on outside services have made it appropriate to review the functions and relation-

ships of the three committees. The College Council has accepted recommendations that, with effect from October 1980, the Board of Management should be renamed the College Computer Management Committee, taking on explicit responsibility for the provision of services and user support on behalf of University users of College facilities and of College users of all the University facilities; and that the Computer Committee should assume more of the character of a 'Users' Committee', with wider representation and its title altered to reflect this definition of its function. There is to be no change in the Policy Committee, which will continue to meet from time to time as need arises.

An account of developments in the Bentham Edition, a project for the publication of Jeremy Bentham's books, correspondence and other papers, appeared in the Annual Report for 1977–78. This year, following discussions between the Joint General Editors, the University and the College, it has been agreed that the National Bentham Committee shall be reconstituted as a Committee of University College on the grounds that this recognises a situation which has existed in practice since 1959, when the project was initiated. There will be no loss of continuity of direction, since members of the former committee have been nominated for appointment to the new one; it includes two members representing the British Academy, on which the project is heavily dependent for financial support. The General Editor, in succession to Professor J. H. Burns, is Dr J. R. Dinwiddy, a member of Royal Holloway College.

A Research Fund has been established from the residuary estate of the late Robert le Rossignol, who died in June 1976, in memory of his wife Emily, to further research into the arthritic condition. The intention is either to award a Fellowship, with the expectation that the results of investigations will be published, or to utilise the annual income for some other purpose related to research in the field of arthritis. Funds will be awarded on the recommendation of a small committee representative of the two Faculties within the new School of Medicine.

*Academic Services Unit*

The Academic Services Unit has now completed its first year of full-time operation under the direction of Mr B. B. Nutt, formerly Senior Lecturer in the Bartlett School of Architecture and Planning. The Unit was joined in January 1980 by an Industrial Liaison Officer, Dr Margot Goldspink; the funds for the post have been provided by the UGC for a two-year period. The Unit, whose especial purpose is to help Departments and members of staff in a wide variety of projects, also provides information and assistance to staff in a number of areas of applied research and development work, the testing of components and instruments, development of prototype equipment and short courses. Staff have been able to use the expertise of the Unit, particularly in handling consultancy work which industrial and commercial organisations quite often prefer to arrange direct with the College rather than with individuals. The number of staff who have shown an interest in using the services of the Unit has increased substantially, and there is every prospect that the Unit will make a positive contribution to the income of the College.

*Lay participation in academic affairs*

As a result of discussion at a meeting of Council in December 1978, a working party drew up proposals for increasing contact between lay members of the Council and staff and students of the College and reported early this session. A number of recommendations has been implemented. Arrangements were made in April, and are to be made each year, for new members of Council to attend the Schools Conference which provides opportunity to encounter the main academic activities through visits to Departments. In addition, some Council members have visited the Departments of Chemistry and Egyptology, the first of a series of such contacts planned. Lay members also accompanied Members of Parliament on their tours of certain Departments in March. Lay membership of various committees, for example the Planning and Buildings Committee and the Committee on College Art Collections, has for long been a feature of College life; recently, in order to assist the interest of lay members in academic affairs and their identification with

academic interests, the Academic Board has warmly endorsed the proposal that there should be two lay Council assessors on its Executive Committee and Departmental Grants Committee.

*Public Lectures*

The following public lectures were among those arranged by the College during the session: Banister Fletcher Lectures by Professor Kenneth Frampton (Columbia) on 'The Isms of Contemporary Architecture', 'The Courtyard and the Labyrinth: Elements for an Urban Strategy' and 'Mario Botta and the School of the Ticino' (3 lectures); Commonwealth Fund Lecture by Professor Ernest R. May (Harvard) on 'Nuclear Weapons and United States Foreign Policy, 1945–1972'; Current Legal Problems Lectures by (i) Dr D. C. M. Yardley (Oxford Polytechnic) on 'Constitutional Reform in the United Kingdom', (ii) Mr M. D. A. Freeman on 'The Rights of Children in the International Year of the Child', (iii) Professor Claire Palley on 'Constitutional Solutions for Northern Ireland', (iv) Professor Michael Zander (London School of Economics) on 'The Report of the Royal Commission on Legal Services', (v) Professor B. Cheng on 'The Moon Treaty', (vi) Dr M. V. L. Korah on 'The Rights of the Defence in Administrative Proceedings under Community Law'; Dorothea Coke Memorial Lecture in Northern Studies by Mrs Ursula Dronke (Oxford) on 'The Role of Sexual Themes in Njáls Saga'; Feldberg Foundation Lecture by Professors E. Neher and B. Sakmann on 'Analysis of Transmitter Action at the Molecular Level'; Freud Memorial Lectures in Psychoanalysis by (i) Dr André Green on 'Psychoanalysis and Ordinary Modes of Thought', 'Psychoanalytic Theory: The Language of Experience', 'Transference and Metaphor', 'Contradictory Aspects of Time in Psychoanalysis', 'The Child and the Dream', 'Representation: A Multiple Function', 'A Hypothetical Model of Language in Psychoanalysis', 'Tertiary Processes and Symbolization', 'Identity and Difference', 'Madness and Psychosis' (10 lectures) (ii) Dr Donald Meltzer on 'Internal Space and Psychoanalytic Theory' (iii) Professor Pinchas Noy (University of Jerusalem) on 'The Psychoanalytic Theory of the Affect'; Neale Lecture in English History by Professor D. C. Coleman (Cambridge) on 'Mercantilism Revisited';

Lord Northcliffe Lectures in Literature by Mary McCarthy on 'Ideas and the Novel' (4 lectures); Smith, Kline and French Lecture in the Allied Health Sciences by Dr J. W. Black (Wellcome Research Laboratories) on 'An Elementary Theorem in Pharmacology'; William Townsend Lecture by Mr Kenneth Martin on 'Chance and Order'.

An Inaugural Lecture was given by Professor R. K. Burcher (Naval Architecture) on 'Methods of Analysis in Ship Design'.

It was a disappointment to the College that Mr Joseph Gormley was prevented by illness at the last minute from delivering the eighty-fourth Foundation Oration in the Collegiate Theatre on 10 March 1980. Everyone was grateful to the Provost for nobly stepping into the breach with a stimulating talk on 'Academic Innovation at UCL', a subject forming the principal theme of a general survey lecture which he gave later in the term.

### *S. V. Keeling Memorial Lecture*

The late Dr Stanley Victor Keeling, formerly Reader in Philosophy at the College, is to be commemorated by a Lectureship founded by a donation of £6,000 from Mr Edward Senior, his pupil and friend. Mr Senior has expressed the wish that the money, in greater part from a legacy to him by Dr Keeling augmented by contributions from three other friends in France, should assist the advancement of scholarship in Greek Philosophy, to which Dr Keeling was dedicated. The Council has gladly accepted Mr Senior's wish that this should be done by means of annual public lectures, the choice of subject to be the lecturer's who is to be chosen from outside the University of London. Arrangements are to be in the hands of the S. V. Keeling Memorial Lectureship Committee.

### *University of London Computer Centre at UCL*

The IBM 360/65 computer was finally withdrawn from service on 31 July, after 13½ years operation. The new system of linked GEC 4082 machines has been in regular use since the beginning of the academic year and is now widely used. Major enhancements of the system are due for delivery in August 1980. The

new equipment was officially inaugurated by Lord Nelson, the chairman of the General Electric Company, at a ceremony on 24 April. The University Court made a special grant of £62,000 for the purchase of several items of graphics equipment for use with the new computers. Reference to changes in the committee structure related to the Computer Centre has been made earlier in this Report.

*Facilities for Disabled Persons*

The Standing Committee on Disabled Persons, whose establishment was reported in the Annual Report for 1978–79, met for the first time in the course of the session. The Committee has decided to concern itself, in the first instance, with general problems of access to, mobility within, and egress from individual departments and areas of the College, and has embarked on a fact-finding exercise. The purpose of this exercise will be to build up an overall picture of which areas of the College are deemed negotiable for disabled persons, whether staff or students, which areas are capable of some improvement, and which areas are likely to continue to pose severe problems for the disabled. The Committee hopes in this way to make progress towards implementing its policy of improving facilities for the disabled when and where circumstances permit.

*College Collections*

Great progress has been made this session in converting the former Refectory Annexe to house the College's art collections. This has been possible owing to a generous donation of £7,000 from the estate of Lord Strang, and the room has been renamed the Strang Print Room in recognition of this valuable contribution towards the completion of the Appeal to finance the work. It had been hoped that the room would be opened at Easter, but additional problems of security have necessitated various structural alterations. It is now hoped that the opening ceremony will be held during the Autumn term next session, after which members of staff, accompanied guests, and students of the College wishing to obtain information about the Collections or to see such works as are on display will be welcome between

1.00 p.m. and 2.00 p.m., or at other times by appointment with the Curator. While the main area of display will remain in the Cloisters, additional works will be exhibited in the Print Room and many prints not on display may be produced for inspection.

Good news comes also from the Egyptology Department where important additions have been made to the Petrie Exhibit. Two ancient linen garments have been displayed, one a funerary robe and the other the remains of a dress which seems certain to be the oldest extant garment from the Nile valley. Other new exhibits include a fine series of wax-encaustic mummy portraits of the Roman period (conserved by students at the Institute of Archaeology) which are the earliest known paintings on board, as distinct from frescoes and wall paintings; sketches and drawings made on potsherds in New Kingdom times (1567–1085 B.C.); and a selection of the figures of cats collected by Mr and Mrs N. Langton and bequeathed to the College in 1972 which represents a satisfying culmination of many years' work on this unique collection.

The Petrie Museum is to be included as a primary target for the College's 150th Anniversary Appeal, and preliminary plans have been approved for the conversion of the third floor of Foster Court to accommodate the museum's collections. This much-needed removal still lies some way in the future, but we may be confident that these fine collections will at last be adequately housed and displayed.

*Schools Conference*

The College was pleased to welcome eighty-four representatives of Schools in England and Wales to the fourteenth annual Schools Conference held on 14 and 15 April. The theme of this year's conference was the College's balanced excellence, and the proceedings opened, following a warm welcome by the Provost, with talks on tradition and innovation in Bloomsbury by Professor Randolph Quirk and on developments in space science by Professor Robert Boyd. These talks, which were published in the June 1980 edition of the College Bulletin, were of such distinction and provoked so much interest among the headmasters that copies have subsequently been circulated to all of the schools which took part in the conference. The participants then went on to visit a total of eight departments within the

seven faculties, and visits were also arranged for the first time to the Computer Centre and the Careers Office. The very full programme of eight visits in under twenty-four hours still left some time for social sessions when friendships were made or renewed and many personal contacts established between the Schools and the College. Ramsay Hall, in which the teachers were accommodated, continues to impress upon participants in the conference the excellence of the College's residential facilities. This factor, coupled with a session devoted entirely to student welfare and amenities, complemented the picture of the College's academic excellence which developed in the course of the conference. Guests went home well satisfied with their two days spent at the College and many letters of appreciation were received.

*Association of Friends of University College London*

During 1979–80 the Friends of University College made grants totalling £2,482 in support of the following projects: purchase of a parachute, barograph and trailer materials for the Gliding Club (£1,000); purchase of two rifles and a pistol for the Rifle Club (£500); provision of film for the Film Society (£200); purchase of two wooden seats for the new garden at Ramsay Hall (£100); purchase of a writing desk and chair for the Quiet Reading Room at Ifor Evans Hall (£300); purchase of equipment for the expedition to the Negev Desert to take place during the summer of 1980, and the printing costs of the final report (£382). In addition the Friends contributed £1,000 towards the refurbishment of the College's Council and Committee rooms, including the framing of pictures for them, and £750 towards the costs and framing of the portrait by Rodrigo Moynihan of Lord Annan.

Since their inception in 1952, the Friends have made grants to College and the Union totalling £72,000. The Friends continue to be asked for help in providing facilities to improve and enhance the quality of life within the College for staff and students. If they are to maintain their important role in the life of the College it is vital that both the membership of the Friends' Association and its income from subscriptions and donations be increased.

HONOURS AND DISTINCTIONS

In the New Year Honours in 1980 the following former students were created Knights Bachelor: H. J. Barnes (Slade School of Fine Art), Director of the Glasgow School of Art; and Dr J. R. Ellis (Physiology and Anatomy), Physician to the London Hospital and Dean of the London Hospital Medical College. Former students who received the C.B.E. were: Professor W. G. Beasley (History), Professor of the History of the Far East in the University of London; Miss P. M. Y. Edwards (Chemistry, Mathematics and Physics) Headmistress Skinners' Company's School for Girls, London; and A. Gwynne-Jones (Slade School of Fine Art), painter and etcher.

In the Queen's Birthday Honours the K.C.B. was conferred on Professor R. Mason, Chief Scientific Adviser, Ministry of Defence, a former Chemistry student; and E. N. Eden, Under Secretary, Department of Trade, a former student of Chemical Engineering, received the C.B. The C.B.E. was conferred on Professor A. S. Prophet, Dean of the Faculty of Clinical Sciences at the College (formerly Dean of UCHMS), on Professor L. B. Schapiro, Emeritus Professor of Political Science at the London School of Economics and Fellow of the College, and on the following former students: C. A. Parker (Chemistry), Deputy Chief Scientific Officer, Ministry of Defence, and M. J. Ward (German), British Council Representative to Italy.

The title of Honorary Fellow was conferred in 1980 on Harold Billett, Professor of Mechanical Engineering and Vice-Provost, University College London, former Acting Provost; on George Charles Drew, Emeritus Professor of Psychology, University College London; and on Charles Martin Robertson, Emeritus Professor and formerly Lincoln Professor of Classical Archaeology and Art, Fellow of Lincoln College, University of Oxford.

The following were elected Fellows of the College in 1979: Denis Cyril Dalton, Director, Group Technical Services, The Plessey Company Limited; Aileen Marian Dickens, Obstetrician and Gynaecologist, University College Hospital, Vice-President of the Royal College of Obstetricians and Gynaecologists; Joseph William Fox, Senior Lecturer and Tutor, Department of Physics and Astronomy, and Schools Liaison Officer, University College London; Barry Millwood Grime, F.Eng., Engineering Director for English China Clays, Lovering, Pochin and Company Limited; Derrick William James, Professor of Anatomy, Vice-Provost, University College London; John Maynard Smith, F.R.S., Professor of Biology, University of Sussex; Leo Steinberg, Benjamin Franklin Professor of History of Art in the University of Pennsylvania; Ernest Vize Symons, former Director General, Board of Inland Revenue, member of College Council and Finance Committee; Gerald Herbert Van Loo, Chairman, Consulux, and Treasurer, Association of Friends, University College London; and Thomas Douglas Whittet, F.P.S., Chairman of the Faculty of the History of Medicine and Pharmacy of the Worshipful Society of Apothecaries and member of its Court.

Important appointments announced during the session included that of G. Manners as a specialist adviser to the Select Committee on Energy. There was a number of elections to academies and learned societies including

those of Professor R. E. D. Bishop and Professor H. P. Rang as Fellows of the Royal Society, Professor F. M. L. Thompson as a Fellow of the British Academy of which Professor E. W. Handley was elected Foreign Secretary, Professor P. G. Foote as a Foreign Member of the Finnish Academy of Sciences, Helsinki, Professor Valerie Pearl as President of the London and Middlesex Archaeological Society, Dr A. H. Wagner as an Honorary Associate of the Royal College of Music, and Dr D. J. B. White as President of the Institute of Wood Science for 1979–80. Professor Sir Andrew Huxley was elected a Fellow of Imperial College. The Right Hon. Lord Annan, Vice-Chancellor of the University of London and formerly Provost, University College London, was appointed Chairman of the Trustees of the National Gallery.

Honorary degrees were conferred on Members of the College as follows: the LL.D. of the University of Pennsylvania on the Right Hon. Lord Annan, the D.Sc. of the Heriot-Watt University on Professor R. L. F. Boyd, the LL.D. of the Chinese University of Hong Kong on Professor B. Cheng, the LL.D. of the University of Southampton on Professor L. C. B. Gower, the LL.D. of the University of Strathclyde on Sir Frank Hartley, the D.Litt. of the University of Southampton on Professor J. Hurstfield, the D.Sc. of the University of Cambridge and the Ph.D. of the Weizmann Institute of Science, Rehovot, Israel on Professor Sir Bernard Katz, and the D.Sc. of the University of Oxford on Professor J. Z. Young.

Other notable honours were the appointment by the French Government of Dr Annette C. M. Lavers as a Chevalier de l'Ordre National du Mérite, and the awards made as follows: the Faraday Medal of the Institute of Electrical Engineers, the J. J. Thompson Medal of its Electrical Division and a share in the Hewlett Packard Europhysics Prize for 1979 to Professor E. A. Ash, the Isaac Schour Memorial Award to Dr A. Boyde, the Founder's Medal of the Royal Geographical Society to Professor W. R. Mead, the Johnson-Matthey Medal to G. P. Ray, and the Goethe Medal of the Goethe Institute to Professor J. P. Stern.

## APPOINTMENTS

At the start of the session Sir Peter Matthews was appointed a co-opted member of Council: he has now been elected as Chairman of Council in succession to Sir Bernard Waley-Cohen in 1980–81. In the course of the session J. E. Mortimer was made a co-opted member of Council and, following the reunification with the College of University College Hospital Medical School, Dr L. C. A. Watson and W. H. W. Wells became the members of Council appointed after consultation with the Camden and Islington Area Health Authority (Teaching).

In the course of the session Professor M. M. Willcock, formerly Professor and Head of the Department of Classics at the University of Lancaster, came to the Chair of Latin and to the Headship of the Department. Within the College Professor R. J. Audley was appointed to the Chair of Psychology and to the Headship of the Department, Professor D. W. J. Johnson succeeded Professor I. R. Christie as Head of the Department of History, and Professor Christie was appointed to the Astor Chair of British History,

having previously been Professor of Modern British History by conferment of title. On the division of the Department of Statistics and Computer Science, Professor M. Stone and Professor P. T. Kirstein became Heads of the Departments of Statistical Science and of Computer Science respectively. The University conferred the title of Professor of Pharmacology on Dr D. H. Jenkinson, of Professor of Biochemical Engineering on Dr M. D. Lilly, and of Professor of Architecture on R. M. Maxwell.

Dr J. B. Long came from the M.R.C. Applied Psychology Unit at Cambridge to the Readership in Ergonomics, and Dr H. G. T. Maehler, formerly Reader in Classics at the Free University, West Berlin, was appointed to the Readership in Papyrology. The title of Dr D. Wilkie's Readership was changed from Readership in Botany to Readership in Microbial Genetics. The following became Readers by conferment of title: Dr D. K. Aitken (Physics), G. A. Cohen (Philosophy), Dr D. Colquhoun (Pharmacology), Dr P. Dunnill (Biochemical Engineering), Dr J. R. Forrest (Electronic Engineering), M. D. A. Freeman (English Law), D. Jacobson (English), D. K. Lal (Political Economy), Dr P. McMullen (Mathematics), Dr T. Thirunamachandran (Chemistry), Dr Anne E. Warner (Anatomy), and Dr R. C. Woledge (Experimental Physiology).

The following Visiting Professors were appointed during the session: Professor K. Espmark, University of Stockholm (Scandinavian Studies); Dr André Green, Paris Psychoanalytic Society (Freud Memorial Visiting Professor of Psychoanalysis); Dr J. P. Hearn, Consultant Scientist with the World Health Organisation (Zoology and Comparative Anatomy); and Dr H. Roberts, Director of Research, General Electric Company (Electronic and Electrical Engineering).

G. F. Arnold was appointed Senior Tutor from the start of the session in succession to H. Marriott.

There was a number of changes in College Faculty appointments, as follows: Professors D. W. J. Johnson, J. L. Jowell, P. R. Bell and D. E. N. Davies became Deans of the Faculties of Arts, Laws, Science and Engineering respectively; and Professors J. E. C. T. White, W. E. Butler, C. A. Rogers, T. H. Lambert and D. Bishop respectively became Vice-Deans of the Faculties of Arts, Laws, Science, Engineering and Environmental Studies. C. E. Gimson was appointed Sub-Dean of the Faculty of Engineering.

During the year announcement was made of the appointment of the following members of the academic staff to posts outside the College: Dr R. D. H. Boyd to the Chair of Child Health and Paediatrics in the University of Manchester, Dr A. W. Nienow to the Chair of Chemical Engineering, University of Birmingham, and Dr A. C. Walker to the Chair of Experimental Mechanics in the University of Surrey.

## RETIREMENTS

Professor J. T. Aitken came to University College in October 1940 following a period between 1936 and 1938 as House Surgeon and House Physician at the Glasgow Royal, Dumfries and Galloway Royal Infirmaries, and so began his long association with the Department of Anatomy and Embryology. During the war years, when the Faculty of Medical Sciences moved

to Leatherhead, he had the responsibility (under Dr Una Fielding) of organising the Topographical Anatomy and Embryology classes. His research into neurohistological problems led to collaborative work with J. Z. Young on the regeneration of nerves and this work developed into an examination of various aspects of nerve supply to muscle devascularization and partial denervation (important in determining direction of blood flow and its effect on injuries involving bone and muscle). He also undertook detailed investigation of motor nerve cells in certain parts of the spinal cord. In association with the late Dr Schweitzer (then in the Physiology Department) he carried out histological studies of carotid sinus nerves and aortic nerves. Latterly he has devoted his time to the organization of courses for Basic Medical Sciences in the Department. He served on many College (and University) Committees and fulfilled the role of both Vice-Dean and Sub-Dean of the Faculty of Medical Sciences. Medical students will long remember his concern for their welfare with warmth and affection, and his work (together with Professors Causey, Joseph and Young) on 'A Manual of Human Anatomy' and 'Essential Anatomy' (with J. Lumley and J. Craven – now in its second edition) which guided them through the basic anatomical knowledge on which their future careers were to be built. His association with outside agencies such as the World Health Organization and ready assistance to other colleges formed part of his unique service to medical education.

Professor A. L. Cullen retired from the headship of the Department of Electronic and Electrical Engineering in September 1980 to take up an SRC Senior Research Fellowship. He joined the College as a lecturer in 1946 from RAE Farnborough and was promoted to Reader before being appointed head of the Electrical Engineering Department at Sheffield in 1955. He returned to the College in 1967 to the Pender Chair of Electrical Engineering. Alec Cullen is best known for his work on microwaves, including the use of radiation pressure for power measurements and open resonator techniques for measurements on dielectrics. He has served on many professional committees and was Chairman of the Electronics Division of the Institution of Electrical Engineers in 1965. He has contributed substantially to College life, for example through membership of many committees and as Dean of Engineering from 1971–73. He received the O.B.E. in 1960 and has been elected both to the Fellowship of Engineering and to the Royal Society. We are all delighted that he has decided to take up his Fellowship at University College to work on a microprocessor-based microwave measuring system and that the College will continue to enjoy his company for at least three more years.

A graduate from the French Department of this College, Professor J. D. O'Connor was appointed to the staff of the Department of Phonetics in October 1945; he became Reader in 1964 and Professor of Phonetics in 1976. Throughout his thirty-five years in the Department his influence on both teaching and research has been profound. Not only was he an unusually successful lecturer, sure of attracting a large audience because of his reputation for lucidity and humour, but he was also a dedicated and good-natured tutor. As postgraduate adviser in more recent years, he showed great skill, patience and humanity in dealing with the problems of

British and foreign students. His published work brought him an international reputation as a leading authority on the intonation of English, and his voice became familiar to listeners all over the world through his radio programmes on learning English. A scholar with a wide knowledge of languages, he published in 1973 his Pelican volume *Phonetics*, which was immediately greeted as a model introduction to the subject and is now used as a standard text in many countries. His colleagues and students alike have always valued his unfailing readiness to help in personal as well as in academic matters. If the Department has been a pleasant place to work in, it has been largely due to his presence – and to the rare respect and affection in which he was held by all who met him.

Reg Butler, who retired in 1980, had held the position of Director of Sculpture Studies for fourteen years. He had previously served as a part-time Assistant Lecturer in Sculpture under Professor Gerrard since 1950. No more highly regarded sculptor has ever taught at the Slade. Since he won the competition for the memorial to the Unknown Political Prisoner in 1952 his reputation has been international and of the highest. Trained as an engineer, his teaching was not only highly practical and technically accomplished but informed by long and intelligent creative experience. At the Slade his contribution was notable for his sympathy with the work of young sculptors in the most varied styles. He always talked as if to a contemporary and a friend, and a long series of postgraduate sculpture students have owed much to his understanding and unsparing support. He has agreed to deliver the William Townsend lecture in November 1980 and his reflections on his long association with sculpture studies are likely to be of the highest interest.

Dr Maurice K. Wells, who retired in September 1980, was appointed Assistant Lecturer in Geology in 1945, having graduated at King's College in 1941 and spent four wartime years in the R.A.F. as a radar instructor and as a meteorologist. He became Lecturer in 1948 and Reader in 1960. He was chairman of the University's Internal and External Boards of Examiners, and of the Board of Studies in Geology from 1968 to 1970. However, it will be as a teacher and supervisor that he will be remembered by numerous former students, and over 130 of these attended a dinner held in College to mark his retirement. His research took him to study basic igneous rocks in Sierra Leone and Norway as well as the Hebrides, and latterly to Etna to study recent, as well as ancient, volcanoes. He was co-author with his father of several editions of *The Petrology of the Igneous Rocks*, a standard textbook.

After war service Dr Gordon Hall graduated in French at U.C.L. in 1947 with first class honours. He joined the French Department in October 1947 as a part-time assistant, becoming an assistant lecturer in 1949 and a lecturer in 1951. In May 1951 he was awarded a Ph.D. for his thesis on the *Roman de Troie*. He was appointed senior lecturer in 1964. Within the French Department Dr Hall was especially appreciated for his teaching of Medieval French Language and Literature, courses which he shared with Professor B. Woledge when he was head of Department. On Professor Woledge's retirement he became the principal teacher of these subjects. Few colleagues have made a greater contribution to the life of this College.

Dr Hall was a devoted, energetic and tireless departmental tutor; as Warden of Ramsay Hall he was outstanding both for the quality of life he ensured for his students and for the financial success of his hall even in periods of retrenchment. His contributions to the Union and to Shenley were sustained over many years and were equally effective. In February 1973 he was made Fellow of the College.

A student at University College (Slade, 1934–37), Cyril Plant joined the part-time staff in 1948, and became a full-time lecturer in 1950. He taught interior design at the Bartlett School of Architecture until the course was discontinued in the sixties. He then spent a period at the Building Research Station, returning to the environmental design and engineering division of the Bartlett. His research in the field of sunlight measurement and control, especially related to buildings in hot, dry climates won him acclaim, and he continued to teach environmental design at the Bartlett until his retirement as Senior Lecturer in 1979. Cyril was also Warden of Campbell Hall for several years. He now lives in Italy.

David Lloyd Morgan, who retired in September 1980, was appointed Secretary of University College Hospital Medical School in 1963 after a career in the Colonial Administrative Service in Northern Nigeria. On the reunification of the Medical School with the College on 1 April 1980 he became Secretary of the Faculty of Clinical Sciences. As Medical School Secretary he was responsible for all aspects of administration including finance, maintenance of buildings, new developments and liaison with University College Hospital, the Whittington Hospital and the College. During his seventeen years at the School major changes took place with an increase in annual intake of medical students from 80 to 100 and of dental students from 25 to 50. David Lloyd Morgan played an invaluable part in the planning leading to reunification and the smoothness with which this took place is a tribute to his skill. He gained the confidence of staff at all levels and the School and Faculty are deeply indebted to him for his devoted service during a critical period in their history.

Hubert Jarvis, F.R.I.C.S., retired on 31 July 1980. Appointed in 1956 as Superintendent of Works he was responsible for a substantial programme of improvements to College buildings until 1973, when he became Superintending Surveyor with responsibility for the maintenance of all College properties. Not only did he then have to face new legislation affecting labour relations and safety, but also spiralling costs in all aspects of building maintenance work and in particular of fuel. He reorganized the Maintenance Section and its systems, modernised its workshop and instituted surveys of plant and buildings. He also made a major contribution to safety in College buildings. His professional skill and his extensive knowledge of building law and of the College will be greatly missed.

RESIGNATION

Professor A. B. Atkinson resigned at the end of 1979 as Professor and Head of the Department of Political Economy to take up the senior chair of Economics at the London School of Economics. He had come to the College three and a half years earlier, at the age of 32, having already been

a Professor at the University of Essex for five years. While here he continued his earlier theoretical and empirical work on taxation and the distribution of income and started a large scale SSRC-financed project on the effects of taxation and social security on the supply of labour and, more generally, the incentives to work. He edited the Journal of Public Economics and sat on the editorial boards of half-a-dozen other journals. He was appointed to the Royal Commission on the Distribution of Income and Wealth and to the chair of the Economics Committee of the SSRC. He was elected to the Council of the Royal Economic Society. His reputation grew by leaps and bounds, but he never ceased to give priority to the affairs of the Department. His energy and efficiency earned him the admiration of his colleagues; his modesty and tact engendered a deep affection towards him; his painstaking and constructive interest in their work was a source of strength and inspiration, particularly for the younger members of the Department.

## RETIREMENTS FROM COUNCIL

In September 1980 the Council lost the services of two Co-opted Members, Mr E. Falk and Miss Janet Powney, who had joined the former College Committee in October 1970 and January 1974 respectively. We should like to thank them very much for all they have done in support of the interests of the College.

## OBITUARY

We record with regret the death during the year of a number of members and former members of the College. They included one Honorary Fellow and eight Fellows.

The College mourns the death of Dr P. Dunsheath. He resigned from the College Committee in July 1966 after twenty-one years of exceptional service to the College which included the difficult immediate post-war period. Not only had Dr Dunsheath served as a member of the College Committee but also as a member, and later Chairman, of the Managing Committee, and as a member of the Finance and Planning and Buildings Committees. The College also owed a great deal to him in many other ways.

We were saddened last February to learn of the death of Sir Edwin Chapman-Andrews. Sir Edwin was a member of the College Committee from 1967 to 1975 and also served for many years on the Fellows Committee. His wide experience in public life made him a most valuable member of our governing body.

Eric Burhop, F.R.S., Professor of Physics from 1960 to 1978, died in January 1980, aged 68, to the great sadness of many friends and colleagues. He graduated in Melbourne and then spent two years in the Cavendish Laboratory, Cambridge, under Rutherford. After returning to Australia in 1935 he held a variety of academic appointments, later joining the British Supply Mission in North America for work on isotope separation under Sir Harrie Massey. Shortly after the war he joined the Mathematics Department at UCL, moving with Sir Harrie to the Physics Department in 1950 where

he remained until retirement in 1978. Atomic and elementary particle physics were an enduring interest and he was a proponent of constructive international collaboration. He was joint founder of the European K meson Collaboration. At CERN in 1962–63 he was responsible for setting up a group of European physicists to study the future policy for accelerators in Europe. For many years he played a leading role in the work of the Bubble Chamber group at UCL in which he made important contributions to investigation in K meson and neutrino physics. He was President of the World Federation of Scientific Workers, and founder member, with Bertrand Russell and others, of the Pugwash Committee, activities illustrating his strong desire for East-West *rapprochement.* He was awarded the Lenin International Prize for Peace in 1972. Eric Burhop will be remembered as an inspired teacher, a dedicated researcher, a conscientious administrator, a man of compassion and one who believed in the social responsibilities of scientists.

Egon Sharpe Pearson, 'ESP', born 11 August 1895, died on 12 June 1980. ESP was an Honorary Research Fellow of the Department of Statistical Science and a Fellow of the College when he died, actively engaged in research on the ideas involved in his early correspondence with 'Student'. His father Karl, 'KP', had been Professor of Applied Mathematics for 11 years when ESP was born. The Pearson era at UCL, and for the world at large, has therefore spanned almost a century. Together and in sequence, the Pearsons laid foundations for the greater part of Statistics as a mathematical academic discipline, with their department providing a unique forum in which many old pillars of received wisdom and practice were demolished and others erected in their place. It is a measure of ESP's stature that he was head of a department that flourished in spite of the personal controversy which was engendered by the strongly held views of its distinguished staff and by the presence of the disturbing genius of R. A. Fisher on another floor of the building which now bears the Pearson name. Through that building passed a stream of researchers who were to influence decisively the shape of Statistics worldwide. Both through them and by his editorship of *Biometrika* from 1936 to 1966 (after KP's 35 years!), ESP encouraged statistical science to combine theory and practice in judicious balance. He achieved this more by example than precept, with a courtesy in debate and a personal kindness that will always be warmly recalled by those fortunate to have known him.

Other Fellows who died during the year were Professor A. C. Burton, Emeritus Professor and formerly Head of the Department of Biophysics, University of Western Ontario, Canada; S. R. Das, formerly Chief Justice of India and Vice-Chancellor of Vieva-Bharati University of Santiniketan; Sir Reginald William Goff, Lord Justice of Appeal, formerly Judge of the High Court of Justice, Chancery Division; Sir Charles Goodeve, formerly Director, British Iron and Steel Research Association, and sometime Reader in Chemistry, University College London; W. S. Lewin, Consultant Neurological Surgeon to Addenbrooke's Hospital, Cambridge, and to the Army Neurological Unit, Colchester Military Hospital; and E. K. Martin, Consulting Surgeon, University College Hospital, and formerly Demonstrator in Anatomy, University College London.

George Charlton entered the Slade School in October 1914, leaving for war service in March 1917. He returned to complete the course between January and July 1919. He was Slade Scholar in 1915 and won the Ross Travelling Scholarship in 1919. Professor Tonks, whom he greatly admired, then immediately appointed him to the staff of the School to teach three days a week from October 1919 onwards. He retired in 1962 at the age of 65. His whole working life was thus given to the Slade School and his contribution to the School, particularly in the teaching of drawing, was very great. He was especially good at teaching the rapid drawing of short poses from the life and many good painters have been indebted to him. He died in September 1979 at the age of 83. Mrs Charlton, his widow, a long-standing friend of the Slade, has declared her intention to found a travelling scholarship in memory of him.

The Reverend Dr A. J. Arkell, M.B.E., M.C., F.S.A., died in February 1980 at the age of 81. He joined the Department of Egyptology in 1948 as Lecturer, and was Reader in Egyptian Archaeology and Curator of the Flinders Petrie Museum 1953–63.

The College heard with regret of the death of Professor H. A. Jahn, formerly Professor of Applied Mathematics in the University of Southampton, a former student of the Department of Chemistry.

# PUBLICATIONS

## BY MEMBERS OF COLLEGE DEPARTMENTS
## 1 AUGUST 1979 – 31 JULY 1980

## *FACULTY OF ARTS*

### ANTHROPOLOGY

BURNHAM, P. C., Changing agricultural and pastoral ecologies in the West African Savanna region. *Human ecology in Savanna environments,* ed. David R. Harris. London: Academic Press, 1980, 147–70.

Raiders and traders in Adamawa: slavery as a regional system. *Asian and African systems of slavery,* ed. James Watson. Oxford: Basil Blackwell, 1980, 43–72, 311–13, 322–4.

COLEMAN, D. A., Recent trends in marriage and divorce in Britain and Europe. *Demographic patterns in developed countries,* ed. R. W. Hiorns. London: Taylor and Francis, 1980, 83–125.

Race. *New Caxton Encyclopaedia, Vol. 16,* London: Caxton Publications, 1979, 171.

(with Lasker, G. W. and others), Ancestral relationships within and between districts in the region of Reading, England, as estimated by isonymy. *Human Biol.,* 51 (1979), 445–60.

A study of the spatial aspects of partner choice from a human biological viewpoint. *Man,* n.s. 14 (1979), 414–35.

A study of marriage and mobility in Reading, England. *J. Biomed. Sci.,* 11 (1979), 369–89.

A note on the frequency of consanguineous marriages in Reading, England, in 1972–1973. *Human Heredity,* 30 (1980), 278–85.

Statistical studies of marriage and the integrity of society, (a synopsis of the Caradog Jones lecture 1979, given at the London School of Hygiene and Tropical Medicine). *Eugenics Rev.,* 12 (1980), 3–7.

Some genetical inferences from the marriage system of Reading Berkshire, and its surrounding area. *Ann. Hum. Biol.,* 7 (1980), 55–77.

HOMEWOOD, KATHERINE (with Waser, P.), Cost-benefit approaches to territoriality: a test with forest primates. *Behavioural Ecology and Sociobiol.,* 6 (1979), 115–20.

HUMPHREYS, SARAH C., *Saggi antropologici sulla Grecia antica.* Bologna: Patron, 1979, 508 pp.

Foreword *The Ancient City,* N. D. Fustel de Coulanges. Baltimore: Johns Hopkins University Press, 1980, xi–xxiii.

Oikos e polis *Rivista Storica Italiana,* 91 (1979), 545–63.

MARTIN, R. D., (with Bearder, S. K.), The social organisation of a nocturnal primate revealed by radio-tracking. *A Handbook on Biotelemetry and Radio Tracking,* ed. C. J. Amlaner and D. W. Macdonald. Oxford: Pergamon Press, 1979, 633–48.

(with Stavy, M., Gilbert, D.), Routine determination of sex in monomorphic bird species using faecal steroid analysis. *Int. Zoo. Yb.* 19 (1979), 209–14.

(with Hunter, J., Dixson, A. F., Rudder, B. C.), Gestation and inter-birth intervals in the owl monkey (*Aotus trivirgatus griseimembra*). *Fol. Primatol.,* 31 (1979), 165–75.

(with Bearder, S. K.), Radio bush baby. *Nat. Hist.,* 88 (1979), 76–81.

First discovery of fossil tree shrews. *Nature,* 281 (1979), 178.

Le plus ancien des primates n'est pas un primate. *La Recherche,* 11 (1980), 469–71.

Adaptation and body size in primates. *Z. Morph. Anthrop.,* 71 (1980), 115–24.

NUGENT, S., Review of Alan Jenkins, Social Theory of Levi-Strauss. *Man,* n.s. 14 (1979), 573–4.

RICHARDS, P., (with Wetherell, H. I., Holt, J.), Drought in the Sahel: a broader interpretation. *Proc. of the Symposium on Drought in Botswana.* Worcester, New Hampshire: Clark University Press, 1979, 131–41.

Community environmental knowledge in African rural development, *I.D.S. Bull.,* 10 (1979), 28–36.

ROWLANDS, M. J. J., Local and long distance trade and incipient state formation on the Bamenda Plateau in the late 19th century. *Paideuma,* 25 (1979), 1–19.

STRATHERN, A. J., Australasia/Pacific. *Atlas of Man,* ed. J. Gaisford. London: Marshall Cavendish editions, 1978, 244–7.

'We are all of one father here': models of descent in New Guinea Highlands societies. *Segmentary lineage systems reconsidered,* ed. L. Holy. Belfast: Queen's University Papers in Social Anthropology, 4 (1979), 145–55.

Papua Nuova Guinea: profilo delle culture. Yoshino Oishi *Oggi diecimila anni fa,* Milan: Arnoldo Mondadori Editore, 1979, 7–37.

Melanesia. *Mythology, an illustrated encyclopaedia,* ed. R. Cavendish. London: Orbis Publications, 1980, 278–83.

Reversals of perspective in the search for legitimacy: or, history becomes myth again. *Cambridge Anthropology,* 5 (1979), 47–53.

Violence – with spear or pen. *RAIN,* 35 (1979), 5–6.

'It's his affair': a note on the individual and the group in New Guinea Highlands societies. *Canberra Anthropology,* 2 (1979), 93–113.

Gender, ideology and money in Mount Hagen. *Man,* n.s. 14 (1979), 530–48.

Men's house, women's house: the efficacy of opposition, reversal and pairing in the Melpa *Amb Kor* cult. *J. Polynesian Soc.,* 88 (1979), 37–54.

The 'red box' money cult in Mount Hagen, 1968–71. *Oceania,* 50 (1979), 88–102; 50 (1980), 161–75.

## CLASSICAL ARCHAEOLOGY

JOHNSTON, A. W., *Trademarks on Greek Vases.* Warminster: Aris and Phillips Limited, 1979. 270 pp.

Rhomis. *Zeit. für Papyr. und Epig.,* 38 (1980), 95–7.

## EGYPTOLOGY

ADAMS, B. G., New Exhibitions in the Petrie Museum of Egyptian Archaeology: Graeco-Ramn Mummy Portraits. *The Museum Archaeologist,* 4 (1979), 11–12.

A lettuce for Min. *Göttinger Miszellen,* Heft 37, 1980, 9–15.

FAULKNER, R. O., Coffin Texts III, 317r: a correction. *J. Egyptian Arch.,* 65 (1979), 161.

HALL, R. M., New Exhibitions in the Petrie Museum of Egyptian Archaeology: Ancient Egyptian Linen Dresses. *The Museum Archaeologist,* 4 (1979), 9–10.

Burial Dresses in the Petrie Collection. *The Bulletin, University College London,* 4, 18 (1980), 4–5.

(with Landi, S.), The Discovery and Conservation of an Ancient Egyptian Linen Tunic. *Studies in Conservation,* 24 (1979), 141–52.

MARTIN, G. T., Excavations at the Memphite tomb of Horemheb, 1978: preliminary report. *J. Egyptian Arch.*, 65 (1979), 13–16.
The New Kingdom necropolis at Saqqara. *Acts of the First International Congress of Egyptology, Cairo 1976*, ed. W. F. Reineke. Berlin, 1979, 457–63.
Private-name seals in the Alnwick Castle Collection. *Mitt. des Deutschen Arch. Inst. Abt. Kairo*, 35 (1979), 215–26.
SAMSON, J., Akhenaten's Successor. *Göttinger Miszellen*, Heft 32, 1979, 53–8.
SETON-WILLIAMS, M. V., *Le Trésor de Toutankhamon.* Paris: Editions Princesse, 1979. 207 pp., 155 pls.
SMITH, H. S., (with Emery W. B., Millard, A.), *The Fortress of Buhen: The Archaeological Report.* London: Egypt Exploration Society, 1979. 225 pp., 108 pls.
(with Jeffreys, D. G.), The Anubieion, North Saqqara: Preliminary Report, 1977–1978. *J. Egyptian Arch.*, 65 (1979), 17–29.
UPHILL, E. P., The Bibliography of Thomas Eric Peet (1882–1934). *J. Egyptian Arch.*, 65 (1979), 144–50.

## ENGLISH LANGUAGE AND LITERATURE

ASHTON, ROSEMARY D., *The German Idea: Four English Writers and the Reception of German Thought 1800–1860.* London: Cambridge University Press, 1980. 245 pp.
CLIFFORD, GAY A. R., Poetry. *The Anthology of Magazine Verse and Yearbook of American Poetry*, ed. Alan F. Pater. Beverley Hills: Monitor, 1980.
Poetry. *Women Their World*, ed. Eva Figes, Abigail Mozley and Dinah Livingstone. Lancaster Literature Festival with Platform Poets, 1980.
Poetry. *Encounter*, July 1980.
Some Have It, Some Don't (on Stanley Middleton). *Contemporary Literary Criticism* 7, ed. Dedria Bryfonski. Michigan: Gale, 1978.
DANIELL, D. J., (Editor). Introductions and notes. *The Best Short Stories of John Buchan.* London: Michael Joseph, 1980.
(with Easson, A.), Shakespeare. *The Year's Work in English Studies, 58*, ed. James Redmond. London: The English Association, John Murray, 1980, 127–71.
DUFFY, ANTONIA S., (Byatt, A. S.), (Editor). George Eliot's *The Mill on the Floss.* Harmondsworth: Penguin English Library. 1979, 685 pp.
*George Eliot.* Harmondsworth: Penguin Books, 1980, 15 pp.
Preface. Willa Cather's *A Lost Lady.* London: Virago Press, 1980, v–xiv.
Preface. Willa Cather's *My Antonia.* London: Virago Press, 1980, i–iv.
Preface. Grace Paley's *The Little Disturbances of Man.* London: Virago Press, 1980, i–iv.
William Golding, *Darkness Visible. Literary Review*, 1 (1979), 10–11.
FENDER, S., The Marriage of Flesh and Air. *Times Literary Supplement*, 4027 (1980), 617–8.
Anglo-America. *The London Review of Books*, 2, 6 (1980), 14.
JACOBSON, D., D. H. Lawrence and the Mince Pies. *London Review of Books*, 1,1 (1979), 24–5.
MASON, M. Y., Fiction and Illustration. *Novels and Novelists*, ed. Martin Seymour-Smith. London: Windward, 1980, 241–52.
MILLER, K. F. C., Cockburn, Nature and Romance. *Lord Cockburn—A Bicentenary Commemoration.* Edinburgh: Scottish Academic Press, 1979, 124–65.
Salim and Yvette (the fiction of V. S. Naipaul). *London Review of Books*, 1,1.
NEWALL, VENETIA, Entries on Robert Chambers; William Clouston; George Cox; Marian Cox, *Enzyklopädie des Marchens*, ed. K. Ranke. Berlin: Walter de Gruyter, 1979, Vol. 2, 1216–7; Vol. 3, 79–80, 160–2.

The Village Year. *Book of British Villages,* London: Drive Publications, 1980, 26–9.
Tell Us a Story. *Not Work Alone: A Cross-Cultural View of Activities Superfluous to Survival,* ed. Jeremy Cherfas and Roger Lewin. London: Temple Smith, 1980, 199–213.
The Dog-Headed St Christopher. Epopee Animale, Fable et Fabliau, Marche Romane. *Mediaevalia,* 28 (1979), 131–9.
The Jews of Cornwall in Local Tradition. *The Jewish Historical Society of England: Transactions,* 26 (1979), 119–21.
Narrative as a Means of Communication. *Ethnologica: Recherches sur L'Histoire Comparative des Institutions et du Droit,* 2 (1979), 58–62.
B. Messenger, *Picking up the Linen Threads: A Study in Industrial Folklore. The Local Historian,* 13 (1979), 438–9.

QUIRK, R., Language and Nationhood. *The Crown and the Thistle,* ed. Colin MacLean. Edinburgh: Scottish Academic Press, 1979, 56–69.
Sound Barriers and Gangbangsprache. *The State of the Language,* ed. C. Ricks and L. Michaels. Berkeley: University of California Press, 1980, 3–14.
Dictionaries. *London Review of Books,* 1 (1979), 25–7.
Considering Our English. *Times Literary Supplement,* 14 December 1979, 116.
(with Svartvik, J.), *A Corpus of English Conversation.* Lund: Gleerup, 1980. 891 pp.
(with Whitcut, J.), Issues in Contemporary Usage. *Times Educational Supplement,* February–July 1980.
Dialect maps. *Books and Bookmen,* 24 (1979), 44.
Language Rich of Treasures. *The Times,* 27 May 1980, 9.

SUTHERLAND, J. A., Approaches to the Novel *and* The Novel and the Book Trade. *Novels and Novelists,* ed. Martin Seymour-Smith. London: Windward, 1980, 55–65, 267–79.
The Fiction Earning Patterns of Thackeray, Dickens, George Eliot and Trollope. *Browning Institute Studies,* 7 (1979), 71–92.

TROTTER, W. D., *The Poetry of Abraham Cowley.* London: Macmillan, 1979. 162 pp.

WALKER, K., *Byron's Readers: A Study of Attitudes Towards Byron 1812–1832.* Salzburg: Institut für Anglistik und Amerikanistik, Universität Salzburg, 1979. xiii + 259 pp.
Settling Accounts. (On Byron's Letters.) *London Review of Books,* 2,6 (1980), 13–14.

## SLADE SCHOOL OF FINE ART

BAWDEN, LISBETH-ANNE H., The Universities and Research in the 1980s and 1990s. *Times Higher Education Supp.,* 18 July 1980.

GOWING, LAWRENCE, *Matisse.* London: Thames and Hudson, 1979. 216 pp.
Essay on Patrick George. *Catalogue Patrick George Paintings and Drawings 1937–1980,* Arts Council of Great Britain, 1980, 15 pp.

## FRENCH LANGUAGE AND LITERATURE

ATACK, M., How the narrator became a man of letters. Reading of a Lacan article from a literary point of view. *Lettera,* Cardiff University Press, 1979. 206–11.

BAKER, FELICITY, La Route contraire. *Reappraisals of Rousseau: Studies in honour of R. A. Leigh,* ed. S. Harvey, M. Hobson, D. Kelley and S. B. B. Taylor. Manchester University Press, 1980, 132–62.

GROVER, Y., Les rapports entre la Chine et l'Europe au Temps des Lumières. Actes du IIe. Colloque international de sinologie. *Les Belles Lettres, Cathasia,* (1980).

MACEY, D., Jacques Lacan, *Ecrits: A Selection; the Four Fundamental Concepts of Psychoanalysis. Ideology and Consciousness* No. 4, 1978.

Yves Dangerfield's *The Little Mermaids.* Trans. Godalming: Ram Publishing Company, 1979.

*Réponses: The Autobiography of Françoise Sagan.* Trans. Godalming: Ram Publishing Company, 1979.

MANN-PHILLIPS, M., *Erasmus on his Times* (Reissue). Cambridge University Press, 1980. 172 pp.

The Correspondence of Erasmus and Thomas More. *Thomas More, 1477–1977,* Colloque international, ed. Alois Gerlo. Brussels: Editions de l'Université, 1980 28–37.

SCREECH, M. A., *Rabelais.* London: Duckworth, 1980. 494 pp.

*Ecstasy and the Praise of Folly.* London: Duckworth, 1980. 267 pp.

The first edition of *Pantagruel.* (Bibliographical details and their help in dating Rabelais's first Chronicle and in appreciating aspects of its impact). *Etudes Rabelaisiennes, XV,* Geneva: Droz, 1980, 31–42.

Seraphino Calbarsy (Phrançoys Rabelais) La grant pronostication nouvelle pour Lan Mille Cinq cens quarante et ung. Avec Fac-similé, introduction et notes. *Etudes Rabelaisiennes XV,* Geneva: Droz, 1980, 181–209.

TANCOCK, L. W., Voltaire's *Letters on England.* Trans., with intro. Harmondsworth, Penguin Books, 1980. 157 pp.

Marivaux: *Up from the Country.* Trans. with intro. Harmondsworth Penguin Books, 1980. 244 pp.

WOLEDGE, B., Les couples COM/CON et DOM/DON chez le copiste Guiot. *Mélanges offerts à Charles Foulon.* Université de Haute Bretagne, I, 1980. 403–8.

Fifteen years with a computer. *Computers and Medieval Data Processing,* IX, 1, (1979), 13–16.

Traits assurés par la rime ou par la mesure: l'exemple de Guiot copiste de Chrétien. *Mélanges de langue et littérature françaises du moyen âge offerts à P. Jonin,* Aix-en-Provence: Université de Provence, 1979, 719–27.

## GEOGRAPHY

ALEXANDER, D. E. (with Rendell, M. H.), A note on some spatial and temporal variations in ephemeral channel form. *Bull., Geol. Soc. Amer.,* 1, 90 (1979), 761–72.

Catastrophic misconception? *Area* 11,3 (1979), 228–30.

Simulation of channel morphology: problems and prospects. *Progress in physical geography,* 3,4 (1979), 544–72.

Demodulation of channel morphological series. *Mathematical Geology,* 12,1 (1980), 79–84.

The Florence floods – what the papers said. *Environmental Management,* 4,1 (1980), 27–34.

*i calanchi* – accelerated erosion in Italy. *Geography,* 46,2 (1980), 95–100.

BATTARBEE, R. W. (and others), 210pb, $^{137}$Cs and $^{239}$Pu profiles in ombrotrophic peat. *Oikos,* 33 (1979), 40–5.

Early algological records: help or hindrance to palaeolimnology? *Nova Hedwigia,* 64 (1979), 379–94.

Diatoms in lake sediments. *Palaeohydrological changes in the temperate zone in the last 15,000 years,* ed. Berglund, Lund, 177–226.

BROWN, E. H., The Shape of Britain. *Trans. Inst. Br. Geogr. N.S.*, 4 (1979), 449–62.
Environmental background and relief regions. *Atlas of Drought in Britain* 1975–6, ed. J. C. Doornkamp, K. J. Gregory and A. S. Burn. London: Institute of British Geographers, 1980, 25–6.
Introduction. *Geography Yesterday and Tomorrow*, ed. E. H. Brown. Oxford: O.U.P., 1980, i–iv.
BURGESS, J. A., Place-making: the contribution of environmental perception studies in Planning. *Geography*, 64,4, 1979, 317–26.
CARTER, F. W., Ragusa: The City Republic of Dubrovnik. *History Today*, 30, 1980, 46–51.
Aktuelle Entwicklungsprobleme in der Region Gross – London. *Geographische Berichte*, 93, 4, 1979, 227–40.
CLOUT, H. D., Land-use change in Finistère during the eighteenth and nineteenth centuries. *Études Rurales*, 73 (1979), 69–96.
Rural settlements. *Progress in Human Geography*, 3 (1979), 417–24.
In search of France. *Progress in Human Geography*, 3 (1979), 591–97.
Het frans-belgische industriegebied. *Europese Probleemgebieden*, ed. D. Burtenshaw, I. B. Thompson, H. D. Clout. Bussum: Unieboek, Geografische Vakbibliotheck, 1978, 101–44.
GILBERT, A. G., (with Sollis, P. J.), Migration to small Latin American cities: a critique of the concept of 'fill-in' migration. *Tijd. Econ. Soc. Geog.*, 70 (1979), 110–13.
Colombia: Closing the gap? The economy under the Lopez administration. *Bank of London and South America Review*, 12 (1978), 400–9.
The State and regional income disparities in Latin America. *Bulletin of the Society for Latin American Studies*, 29 (1978), 5–30.
Regional Development Studies: A review. *Latin American Research Review*, 14 (1979), 188–92.
La planificación ante la primacia urbana y las grandes ciudades en Emerica Latina. *Ensayos histórico-sociales sobre la urbanización en América Latina*, ed. J. E. Hardoy, R. M. Morse, R. P. Schaedel. Buenos Aires: SIAP-CLACSO, 1978, 131–57.
Planning for urban primacy and large cities in Latin America: a critique of the literature. *Actes du XLii^e Congrès International des Americanistes*, Paris, 339–49.
HARRIS, D. R., (Editor of and contributor to). *Human Ecology in Savanna Environments*. London: Academic Press, 1980 xvii + 522 pp.; contributions: Tropical savanna environments: definition, distribution, diversity, and development, 3–27, Commentary: Human occupation and exploitation of savanna environments, 31–9, Commentary: Ecology, demography, and development in savanna environments, 293–6.
Continuities and change in tropical savanna environments. *Current Anthropology*, 20 (1979), 394–7.
HOLLIS, G. E., Nature conservation projects for the national park of Ichkeul. *Bull. Office National des Pêches* (Tunisia), 2 (1978), 235–48.
(with Wood, B. and Warren, A.), Rare wetlands in a National Park. *Geographical Magazine*, (Feb. 1980), 331–5.
(with Warren, A., Wood, J. B., Hooper, M. D., and Fisher, R. C.), Ichkeul, The Problems of a Wet Park in a Dry Country. *Parks*, 4, 3, 1979, 6–10.
Environmental management of agricultural watersheds. *Area*, 11, 4 (1979), 288.
Hydrological computations. *Area*, 12, 1 (1980), 24.
Water management in England and Wales. *Geography*, 64 (1979), 357.
(with Kite, D.), The maintenance and enhancement of nature conservation in improved river channels. *Conference of River Engineers Report 1979*, Ministry of Agriculture Fisheries and Food. Mimeo.

LOWENTHAL, DAVID, Lack of management threatens English landscape. *Landscape Architecture,* (1979), 254–6.

Environmental perception: preserving the past. *Progress in Human Geography,* 3, (1979), 549–59.

Our Past before us: why do we save it? *London Journal,* 5, (1979), 305–6.

Age and Beauty. *The Aesthetics of Landscape,* ed. J. H. Appleton. Oxford: Rural Planning Services for the Landscape Research Group, 1980.

MANNERS, G., Regional development and planning in Britain; some emerging challenges. *Régions Geographiques et Régions d'Amenagement,* ed. J. I. Clarke and J. Pelletier. Lyon: Hermes, 1978, 13–19.

Reinterpreting the regional problem. *Fundaments of Human Geography,* ed. D. Blunden *et al.* London: Harper and Row, 1978, 367–75.

The geography of mineral supply: the mainsprings of future uncertainties. *Geoforum,* 10, (1979), 323–32.

Prospects and problems for an increased resort to coal in Western Europe 1980–2000. *Selected Studies in Energy: Background Papers for Energy: the Next Twenty Years,* ed. H. H. Landsberg. Cambridge, Mass.: Ballinger, 1979, 267–96.

Prospects and problems for an increased resort to nuclear power in Western Europe 1980–2000. *Selected Studies in Energy. Ibid.* 297–322.

(Contributing editor, with D. Deebe, B. Rodgers, K. Warren). *Regional Development in Britain.* Chichester: John Wiley and Sons, 1980, 432 pp, 2nd ed.

Why the vital resource in resourcefulness. *The Times Higher Education Suppl.,* 2 May (1980), 10.

MEAD, W. R., The Identity of Finland. *Contemporary Review,* 235 (1979), 57–62.

Zachris Topelius. *Geographers, Biobibliographical Studies,* ed. T. W. Freeman, and Philippe Pinchemel, 3, 1979, 161–3.

Regional Geography. *Geography Yesterday and Tomorrow,* ed. E. H. Brown. Oxford University Press, 1980, 292–302.

PRINCE, HUGH, Richard Cobb: on intimate terms with the past. *J. of Historical Geography,* 5 (1979), 327–36.

Old World into New, New World into Old: some reflections on the frontier theme of CUKANZUS '79. *Historical Geography,* 9 (1979), 15–18.

Antique land. *The Aesthetics of Landscape,* ed. J. Appleton. Didcot: Rural Planning Services, 1980, 36–45.

Historical geography in 1980. *Geography Yesterday and Tomorrow,* ed. E. H. Brown. Oxford University Press, 1980, 229–50.

SALT, J., International migration: the state of the art. *Area,* 11, 4, 338–9.

Labour migration, housing and the labour market. *The Inner City: Employment and Industry,* ed. A. Evans and D. Eversley. London: Heinemann, 1980, 253–68.

(with Flowerdew, R.), Labour migration from London. *The London Journal,* 6, (1980), 18–39.

(with Johnson, J. H.), Employment Transfer policies in Great Britain. *The Banks Review,* 126, (1980), 36–50.

STEVENSON, W. I., The diffusion of disaster. The phylloxera outbreak in the *département* of the Hérault 1862–80. *J. of Historical Geography,* 6 (1980), 47–63.

THORNES, J. E., Constable's Cloud Studies. *Weather,* 34, 8 (1979), 308–15.

The best practicable means of air quality management in the European Community? *Progress in Physical Geog.,* 3, 3 (1979), 427–42.

Constable's Clouds. *The Burlington Magazine,* cxxv (920) (1979), 697–704.

VITA-FINZI, C., Contributions to the Quaternary geology of southern Iran, *Reports Geol. Mining Survey Iran,* 47 (1979), 1–52.

(with Copeland, L.), Surface finds from Iranian Makran, *Iran,* 18 (1980), 149–55.

WARREN, A., Windflow and Eolian (sic) Processes. *Geomorphological Processes,* eds. C. Embleton, and J. E. Thomas. London: Arnold, 1979, 65–72, 325–51.
(with Hooper, M. D., Fisher, R. C. eds.), The Covadonga National Park, Spain, A preliminary management plan. *Discussion Papers in Conservation,* 23 (1979), 23 pp.

WARREN, A., HARRISON, C. M., Ecological information and the allocation of resources to recreation: experience in the South London Greenbelt. *Recreation Ecology Research Group Report, No. 3* (1979), 17–28.

WOOD, P. A., Location theory and spatial analysis (Progress Report). *Progress in Human geography,* 3, 4 (1979), 585–89.

## GERMAN

STERN, J. P., *Guida a Nietzsche.* Trans. Libero Sosio's. Milano: Biblioteca Universale Rizzoli, 1980, 160 pp.
The Mind of Nietzsche. The British Academy lecture on a Master-Mind 1978. *Proc. of the British Academy* (LXIV), Oxford University Press, 1978, 11–26.
Living in the Metaphor of Fiction. *Comparative Criticism,* I, ed. E. Shaffer. Cambridge University Press, 1979, 3–16.
Das Bild der Wissenschaft in der Öffentlichkeit, von einem Ausländer gesehen. *Das Bild der Wissenschaft in der Öffentlichkeit.* Fortbildungsprogramm für die Wissenschaftsverwaltung, Materialien Nr. 1, hrsg. von der Arbeitsgruppe Fortbildung im Sprecherkreis der Hochschulkanzler, Saarbrücken, 1978, 67–76.
Zwei Arten des historischen Bewußtseins in Thomas Mann's *Doktor Faustus. Literatur und Kritik,* 139, 1979, 535–9.
(with Stern, Sheila), The Troublemaker of Heidenheim. *New Statesman,* 21.xii. (1979), 986–7.

SWALES, M. W., *Thomas Mann.* London: Heinemann, 1980. 117 pp.
The German *Bildungsroman* and the 'Great Tradition'. *Comparative Criticism,* ed. E. Shaffer. Cambridge University Press, 1979, 91–105.
Keller's Realism: Some observations on *Romeo und Julia auf dem Dorfe. Formen realistischer Erzählkunst,* ed. J. Thunecke. Nottingham: Sherwood Press, 1979, 159–68.
The Consciousness and the Conscience of the Artist. *German Life & Letters,* 32 (1979), 343–6.

## GREEK

COCKLE, W. E. H., A new Virgilian writing exercise from Oxyrhynchus. *Scrittura e Civiltà,* 3 (1979), 55–75.

COLES, R. A., Editions of 16 Greek papyri (P.Oxy. 3318, 3324, 3335, 3339–46, 3348–9, 3353, 3359, 3363). *The Oxyrhynchus Papyri,* vol. XLVII, ed. P. J. Parsons, J. R. Rea and E. G. Turner. London: Egypt Exploration Society, 1980.
P. Harr. 73 and 160 revised. *Zeitschrift für Papyrologie und Epigraphik,* 37 (1980), 229–39.

GOLDBERG, S. M., The making of Menander's comedy. London: Athlone Press, 1980, viii + 148 pp.

GRETTON, M. F., Review of: Charles H. Kahn, *The Art and Thought of Heraclitus. Bull. of the Joint Association of Classical Teachers,* 53 (1980), 27–8.

HANDLEY, E. W., Recent papyrus finds: Menander. *Bull. of the Institute of Classical Studies,* 26 (1979), 81–7.

The ancient theatre and the visual arts. *Research in Universities.* London: Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom, 1980, 43–5.

HOOKER, J. T., Edition of Homer, *Iliad* III. Bristol Classical Press, 1979. vi + 89.

γέφυρα: a Semitic loan-word? *Studies in Diachronic, Synchronic and Typological Linguistics: Festschrift for Oswald Szemerényi (Current Issues in Linguistic Theory, vol. 11)*, ed. Bela Brogyanyi. Amsterdam: John Benjamins B.V., 1979. 387–98.

Indo-European themes in Homer. *American, Indian and Indo-european Studies: Papers in Honor of Madison S. Beeler,* ed. K. Klar, M. Langdon and S. Silver. New York: Mouton Publishers, 1980. 357–73.

The *wanax* in Linear B texts. *Kadmos,* 18 (1979), 100–11.

εἴ ποτ ἔην γε. *American Journal of Philology,* 100 (1979), 393–5.

Future imperatives in Homer. *Münchener Studien zur Sprachwissenschaft*, 38 (1979), 87–92.

Ilios and the *Iliad. Wiener Studien*, 92 (1979), 5–21.

ἐνυπάς. *Die Sprache*, 25 (1979), 174–5.

New reflexions on the Dorian invasion. *Klio*, 61 (1979), 353–60.

The unity of Alcman's *Partheneion. Rheinisches Museum*, 122 (1979), 211–21.

Two passages in the *Frogs. Maia*, 31 (1979), 245–6.

The apparition of Heracles in the *Odyssey. Liverpool Classical Monthly*, 5 (1980), 139–46.

Reviews of Ø. Andersen, *Die Diomedesgestalt in der Ilias,* W. Bergold, *Der Zweikampf des Paris und Menelaos* and O. Tsagarakis, *Nature and Background of Major Concepts of Divine Power in Homer. Journal of Hellenic Studies*, 99 (1979), 168.

HORSFALL, N. M., Stesichorus at Bovillae? *Journal of Hellenic Studies*, 99 (1979), 26–48.

The iconography of Aeneas' flight: a practical detail. *Antike Kunst*, 22 (1979), 104–5.

Doctus sermones utriusque linguae? *Echos du monde classique,* 23 (1979), 79–95.

MAEHLER, H. G. T., Zweisprachiger Aeneis-Codex. *Actes du XVe Congrès international de Papyrologie, 2e partie* (Papyrologica Bruxellensia 17). Brussels: Fondation Egyptologique Reine Elisabeth, 1979. 18–41, 3 pls.

Hauser und ihre Bewohner im Fayum in der Kaiserzeit. *Wohnungsbau im Altertum* (Diskussionen zur archäologischen Bauforschung, vol. 3). Berlin: Deutsches Archäologisches Institut, 1979. 194–6.

Pindari Carmina, pars I: Epinicia. Post B. Snell ed. H. Maehler (6th edn.), Leipzig: Teubner, 1980. xii + 193.

(with G. H. Karlsson), Ein griechisches Morgengebet aus Ägypten. *Vigiliae Christianae*, 33 (1979), 76–80.

Papyrusbriefe römisch-byzantinischer Zeit. *Zeitschrift für Papyrologie und Epigraphik,* 33 (1979), 279–94 + pl. 12–17.

(with H. Jaritz and K. Th. Zauzich) Inschriften und Graffiti von der Brüstung der Chnumtempel-Terrasse in Elephantine. *Mitteilungen des Deutschen Archäologischen Instituts, Abt. Kairo,* 35 (1979), 125–54 + pl. 20–30.

REA, J. R., Paper hats. *Actes du XVe Congrès internationql de Papyrologie, 3e partie* (Papyrologica Bruxellensia 18). Brussels: Fondation Egyptologique Reine Elisabeth, 1979. 34–8.

P. Oxy. XXXI 2673: πύλην to ὕλην. *Zeitschrift für Papyrologie und Epigraphik,* 35 (1979), 128.

Ἐπιτοιχογράφος. *Ibid.*, 36 (1979), 309–10.

*Ordinatus. Ibid.*, 38 (1980), 217–9.

The *legio II Traiana* in Judaea? *Ibid.*, 38 (1980), 220–1.

CPR VII 11: a date for Corellius Galba? *Ibid.*, 38 (1980), 221–2.

SHARPLES, R. W., 'If what is earlier, then of necessity what is later?': some ancient discussions of Aristotle, *De generatione et corruptione* 2.11. *Bulletin of the Institute of Classical Studies*, 26 (1979), 27–44.

Reviews of the following:

L. Repici, *La Logica di Teofrasto* and G. Giannantoni (ed.), *Scuole Socratiche Minori e Filosofia Ellenistica. Journal of Hellenic Studies,* 99 (1979), 179–80, 189–90.

*Aristotele: La Generazione e la Corruzione,* tr. and comm. M. Migliori. *Archiv für Geschichte der Philosophie,* 61 (1979), 213–6.

TURNER, E. G., The date of the Strasbourg fragments of Euripides, *Alexandros. Miscellanea Codicologica F. Masai Dicata,* ed. P. Cockshaw, M. C. Garand, P. Jodogne. Ghent: E. Story-Scientia S.P.R.L., 1979. 1–5 + 1 pl.

Menander and the new society of his time. *Chronique d'Egypte,* 54 (1979), 106–26.

The rhetoric of question and answer in Menander. *Themes in Drama,* 2 (1980), 1–23.

## HEBREW AND JEWISH STUDIES

ABRAMSKY, C., The crisis of authority within European Jewry in the eighteenth century. *Studies in Jewish Religious and Intellectual History Presented to Alexander Altmann,* ed. Siegfried Stein, Raphael Loewe. The University of Alabama Press, 1979–80, 13–28.

Isaiah Berlin – Man of Ideas. *The Jewish Quarterly,* December 1979, London, 43–4.

GELLER, M. J., Alexander Jannaeas and the Pharisee Rift. *Journal of Jewish Studies,* 30,2 (1979), 1201–11.

A Middle Assyrian Tablet of *Utukku,* Tablet 12. *Iraq* 42 (1980), 23–51.

Review of T. H. Gaster, Myth, Legend and Custom in the Old Testament. *Religious Studies,* 16,1 (1980), 129–30.

LOEWE, R., ed. (with S. Stein), *Studies in Jewish Religious and Intellectual History Presented to Alexander Altmann,* The University of Alabama Press, 1979.

*Ibn Gabirol's Treatment of Sources in the Kether Malkhuth. Ibid.,* 183–94.

*Omnam Ken. Anglo-Jewry's Penitential Hymn.* Jewish Chronicle, 28 Sept. 1979, 27.

RAPOPORT-ALBERT, A., Self Depreciation (*qatnuth, Peshituth*) and Disavowal of Knowledge (*'eyni yode'a*) in Nahman of Braslav. *Studies in Jewish Religious and Intellectual History presented to Alexander Altmann.* The University of Alabama Press, 1979, 7–33 of Hebrew Section.

## HISTORY

BLAKEMORE, H., Latin America: Reverberations of a Revolution. *Annual of Power and Conflict, 1979–1980,* (1980), 327–403.

Recent Books on Latin America. *British Book News* (1980), 261–5.

BOXER, C. R., Europe beyond Europe. *The Faces of Europe,* ed. Alan Bullock. London: Phaidon Press, 1979, 425–35.

The Dutch East-India Company and the China Trade. *History Today,* (1979), 741–50.

War and Trade in the Indian Ocean and the China Sea, 1600–1650. *The Great Circle. Journal of the Australian Association for Maritime History,* I (1979), 5–17.

The Conde da Ericeira and Beauvollier de Courchant, 1721–1722. *Bulletin des Etudes Portugaises et Brésiliennes,* n.s., 37/38 (1979), 33–59.

Miguel Roxo de Brito's narrative of his voyage to the Raja Empat, May 1581–Nov. 1582. *Archipel,* 18 (1979), 175–94.

An Introduction to the *'História Trágico-Marítima'* (1957): some corrections and clarifications. *Quaderni Portoghesi,* 5 (1979), 99–112.

A note on the Portuguese translation by Francisco Ros, S. J., of an ola from the Samorin of Calicut to André Furtado de Mendoça, 1599. *Mare Luso-Indicum,* IV (1979), 89–93.

BURNS, J. H., *Ex Uno Plura?* The British Experience. *Federalism: History and Current Significance of a Form of Government,* ed. J. C. Boogman, G. N. van der Plaat. The Hague: Martinus Nijhoff, 1980, 189–215.

CHRISTIE, I. R., The Earl of Chatham and American Taxation, 1774–1775. *The Eighteenth Century* (formerly *Studies in Burke and his Time*), 20 (1979), 246–59.

CLARKE, HELEN, *A Closer Look at Vikings.* London: Hamish Hamilton and British Museum Publications, 1979. 32 pp.

The archaeology, history and architecture of the medieval ports of the east coast of England, with special reference to King's Lynn. *The Archaeology of Medieval Ships and Harbours in Northern Europe,* ed. S. McGrail. London: British Archaeological Reports, International Series 66, 1979, 155–65.

Review of K. Borg, V. Näsman and E. Wegraeus (eds.), *Eketorp, Fortification and Settlement on Oland/Sweden. The Monument. Medieval Archaeology,* 23 (1979), 281–2.

CRAIG, R. S., *Steam Tramps and Cargo Liners 1850–1950.* London: HMSO, 1980. 60 pp.

The copper ore trade. *Volumes not Values: Canadian Sailing Ships and World Trades,* ed. D. Alexander and R. Ommer. St Johns: Memorial University of Newfoundland, 1979, 247–302.

Conference Summary. *Ibid.,* 361–73.

DAVIES, WENDY E., *The Llandaff Charters.* Aberystwyth: National Library of Wales, 1979. xi + 206 pp.

Roman settlements and post-Roman estates in south-east Wales. *The End of Roman Britain,* ed. P. J. Casey. London: British Archaeological Reports, 71, 1979, 153–73.

The orthography of personal names in the charters of *Liber Landavensis. Bull. Board of Celtic Studies,* XXVIII (1980), 553–7.

d'AVRAY, D. L. (with Bériou, Nicole), Henry of Provins, O.P.'s Comparison of the Dominican and Franciscan Orders with the 'Order' of Matrimony. *Archivum Eratrum Praedicatorum,* xlix (1979), 513–7.

DINWIDDY, J. R., Sir Francis Burdett and Burdettite Radicalism. *History,* lxv (1980), 17–31.

GOBBI, CLAIRE H. G., Edward Blaquiere: agent of liberalism. *Cuadernos Hispano-americanos,* 350 (1979), 306–25.

(Editor). *Bentham Newsletter,* 1979 onwards.

GRAHAM-CAMPBELL, J. A., *The Viking World.* London: Frances Lincoln, 1980. 220 pp., pls. and figs.

*Viking Artefacts: a select catalogue.* London: British Museum Publications, 1980. 312 pp., pls. and figs.

(with Kidd, D.), *The Vikings.* London: British Museum Publications, 1980. 200 pp., pls. and figs.

Britain and Ireland: the fifth to ninth centuries. *The Northern World,* ed. D. M. Wilson. London: Thames and Hudson, 1980, 95–126.

The initial impact of the Vikings on Irish art. *Saga-Book of the Viking Society of Northern Research,* xx (1978–9), 42–8.

HARTE, N. B., *The Admission of Women to University College London: A Centenary Lecture.* London: UCL, 1979. 29 pp.

HUMPHREYS, SARAH C., *Saggi antropologici sulla Grecia antica.* Bologna: Pátron, 1979. 508 pp.

Foreword. N. D. Fustel de Coulanges's *The Ancient City.* Baltimore: Johns Hopkins U.P., 1980, xv–xxiii.

HURSTFIELD, J., *The Illusion of Power in Tudor Politics.* London: Athlone Press, 1979. 34 pp. (The Creighton Lecture).

*Man as a Prisoner of his Past: The Elizabethan Experience.* Cardiff: University of Wales Press, 1980. 25 pp. (A. H. Dodd Memorial Lecture).

ISRAEL, J. I., The Holland Towns and the Dutch-Spanish Conflict, 1621–1648. *Bijdragen en mededelingen betreffende de geschiedenis der Nederlanden,* xciv (1979), 41–69.

The Jews of Spanish North Africa, 1600–1669. *Trans. Jewish Historical Society of England,* xxvi (1979), 71–86.

Some Further Data on the Amsterdam Sephardim and their Trade with Spain during the 1650s. *Studia Rosenthaliana,* xiv (1980), 7–19.

Spanish Wool Exports and the European Economy, 1610–1640. *Econ. Hist. Rev.,* 2nd ser., xxxii (1980), 193–211.

JOHNSON, D. W. J. (with Bédarida, François and Crouzet, François), *Le Lion et Le Coq: De Guillaume le conquérant au Marché commun.* Paris: Albin Michel, 1979. 442 pp.

Rulers and Politicians. *The Faces of Europe,* ed. Alan Bullock. London: Phaidon Press, 1980, 351–62.

L'attitude des protestants britannique aux débuts de la Troisième République. *Les Protestants dans les Débuts de la Troisième République.* Paris: Société de l'histoire du Protestantisme *français,* 1979, 491–500, 535–42.

France's road to war: Dwelling on the Defeat. *Times Lit. Suppl.,* 4006 (1980), 15.

The Gaullist inheritance. *Ibid.,* 4024 (1980), 517–8.

The logic of delusion. *New Society,* 903 (1980), 510–1.

The New Right in France. *Ibid.,* 917 (1980), 206–9.

LYNCH, J., From Americanism to Nationalism in the Movement of Independence. *El Repertorio Americano,* segunda época, 1 (1979), 71–84.

Latin American Studies in the University of London. *Latin American Studies in Europe.* Final Report and Working Papers of the Twenty-third Seminar on the Acquisition of Latin American Library Materials, London 1978 (1979), 181–93.

La comunidad británica en Buenos Aires durante la época de Rosas. *Todo es Historia,* 156 (1980), Suplemento especial, lxviii–lxx.

MILLAR, F. G. B., The *Privata* from Diocletian to Theodosius: documentary evidence. *Imperial Revenue, Expenditure and Monetary Policy in the Fourth Century A.D.,* ed. C. E. King. London: British Archaeological Reports, International Series 76, 1980, 125–40.

MOMIGLIANO, A. D., *Sagesses barbares. Les limites de l'hellénisation,* (trans. by Marie-Claude Roussel). Paris: Maspero, 1979. 197 pp.

*Saggezza straniera. L'Ellenismo e le altre culture,* (trans. by Maria Luisa Bassi). Turin: Einaudi, 1980. 208 pp.

The Rediscovery of Greek History in the Eighteenth Century: The Case of Sicily. *Studies in Eighteenth-Century Culture, vol. 9,* ed. R. Runte. Madison: Univ. of Wisconsin Press, 1979, 167–87.

Foreword. N. D. Fustel de Coulanges's *The Ancient City.* Baltimore: Johns Hopkins U.P., 1980, ix-xv.

Introduction. S. C. Humphreys's *Saggi antropologici sulla Grecia antica.* Bologna: Pátron, 1979, 7–25 (cf. 349–70).

Ciò che Flavio Giuseppe non vide. Introduzione. *Il buon uso del tradimento* (Italian trans. of P. Vidal-Naquet's *Flavius Josèphe ou du bon usage de la trahison.)* Rome: Editori Riuniti, 1980, 9–21.

Die Griechen und wir. Zum historischen Werk von Moses I. Finley. *Antike und moderne Demokratie,* by M. I. Finley. Stuttgart: Reclam, 1980, 118–38.

Contributions to *La storiografia greca,* ed. D. Musti. Bari: Laterza, 1979, 49–62, 73–92.

Flavius Josephus and Alexander's Visit to Jerusalem. *Athenaeum,* n.s. LVII (1979), 442–8.

Declines and Falls. *The American Scholar,* 49 (1979–80), 37–50.

Review of Bruno Gentili, Giovanni Cerri, *La Teorie del discorso storico nel pensiero greco e la storiografia romana archaica. Gnomon,* 51, 1979, 393.

NORTH, J. A., Religious toleration in Republican Rome. *Proc. of the Cambridge Philological Society,* 205 (n.s. 25) (1979), 85–103.

PEARL, VALERIE, John Stow: Commemoration Address delivered before the Lord Mayor and Aldermen of the City of London on April 23, 1979. *Trans. London and Middlesex Arch. Soc.,* xxx (1979), 130–5.

(with Pearl, M.), A revolt in 1529 by Yeomen against the Wardens of the Goldsmiths' Company. *The Review,* (1980), 23–7.

Love's Labours (review of A. Fraser, *King Charles II*). *London Rev. of Books with the New York Review,* xxvi, 17 (1979), 9–10.

New Model History (review of R. Ashton, *The City and the Crown 1603–1640). Ibid.,* xxvii, 1 (1980), 8–9.

Tudor towns and townsmen (review of T. S. Willan, *Elizabethan Manchester* and D. M. Palliser, *Tudor York*). *Times Lit. Suppl.,* 4026 (1980), 573.

STOKES, M. B., American Discontents; From Protests to Revolution; The War of Independence; France and America; Jefferson to Lincoln; Slavery and the Union; Aftermath of Civil War; The Great Republic; USA, Coast to Coast; American Capitalism; Voices of Reform and Protest; 'Teddy' Roosevelt and the Big Stick; American Power; The Roosevelt Era; US Economic and Foreign Policy after 1953. *The Encyclopedia of Modern History.* London: Hamlyn, 1979, 24–31, 92–5, 98–9, 148–59, 216–7, 258–9.

SWART, K. W., Een nieuw 'wetenschappelijk standaardwerk' over de geschiedenis van der Nederlanden in de vroeg-moderne periode. *Bijdragen en mededelingen betreffende de geschiedenis der Nederlanden,* xcv (1980), 127–34.

(with Emery, C. R.), Survey of recent historical works on Belgium and the Netherlands published in Dutch. *The Low Countries History Yearbook. Acta Historiae Neerlandicae,* xi (1979), 181–215.

Survey of recent historical works on Belgium and the Netherlands published in Dutch. *Ibid.,* xii (1979), 126–64.

THOMPSON, F. M. L., Landowners and Farmers. *The Faces of Europe,* ed. Alan Bullock. London: Phaidon Press, 1980, 29–56.

## HISTORY OF ART

BOUCHER, B. A., Baroque Architecture in Venice. *Apollo,* CX, 1979, 388–95.

The Last Will of Daniele Barbaro. *Journal of the Warburg – Courtauld Institutes,* XLII (1979), 277–82.

The Madonna delle Muneghetti: A New Work by Jacopo Sansovino. *The Burlington Magazine,* CXXII (1980) 22–9.

COOKE, LYNNE, Post-Impressionism, *Art Monthly,* 33 (1980) 17–20.

Abstraction: Towards a New Art, *Art Monthly,* 35 (1980) 15–9.

Joel Shapiro. *Artscribe,* 22 (1980) 60.

Held, Louis, Newman, *Artscribe,* 23 (1980), 41–5.
Otto Gutfreund. *Artscribe,* 20 (1979), 58.
Max Liebermann, Max Slevogt, Louis Corinth. *Artscribe,* 21 (1980), 56–7.
Pier and Ocean. *Artscribe,* 24 (1980), 28–9.

HOUSE, J., and others, *The Post-Impressionist Exhibition,* Exhibition Catalogue. London: Royal Academy of Art, 1980.

VAUGHAN, W., *German Romanticism and English Art,* Yale University Press, 1979. 308 pp.
Landscape and the 'irony of nature'. *Art History,* 24, (1979), 457–73.
Englische Kunst und europäische Romantik. *Zwei Jahrhunderte Englische Malerei,* Munich: Haus der Kunst, (1979), 425–92.
Britische Kunst im Ausland, *Zwei Jahrhunderte Englische Malerei,* Munich: Haus der Kunst, (1979), 493–560.

WEBSTER, MARY, *Hogarth,* London, 1979. 191 pp.
Flaxman as Sculptor. *John Flaxman R.A.,* ed. David Bindman. London: 1979. 100–111; German edition, *John Flaxman Mythologie und Industrie,* Munich, 1979, 120–33.

WESTON, HELEN, The Case for Constance Mayer. *Oxford Art Journal,* April 1980.

WHITE, J. E. C. T., *Duccio: Tuscan Art and the Medieval Workshop,* London: Thames and Hudson, 1979.
*Pieter Bruegel and the Fall of the Art Historian,* (Charlton Memorial Lecture.) University of Newcastle-upon-Tyne, 1980, 28 pp.

## ITALIAN

HALE, J. R., Renaissance armies and political control: the Venetian proveditorial system 1509–1529. *The Journal of Italian History,* ii, 1 (1979), 11–31.

HALE, J. R., LINDON, J. M. A., *The Travel Journal of Antonio de Beatis: Germany, Switzerland, the Low Countries, France and Italy 1517–1518.* Trans. Ed. J. R. Hale, Hakluyt Society, 1979, 206 + xii pp.

LEPSCHY, A. L., Nota sulle strutture ternarie nella *Gerusalemme Liberata. Romance Philology,* 33 (1979), 167–71.
*I Malavoglia,* Chapter II: Structure and Themes. *Stanford Italian Review,* 1 (1979), 133–43.
Alcuni studi in inglese sul Boccaccio. *Studix sul Boccaccio,* 11 (1979), 473–81.

LINDON, J. M. A., Italian Studies: Seicento and Settecento. *The Year's Work in Modern Language Studies,* 40 (1979), 487–504.
Alfieri's translations from Greek: an autograph fragment of the *Filottete* and an anti-Napoleonic epigram. *Italian Studies,* XXXV (1980), 62–7.

## LATIN

COFFEY, M., Turnus and Juvenal, *Bull. Inst. Classical Studies,* 26 (1979), 88–94.

CONSIDINE, P., *A Semantic Approach to the Identification of Iranian Loanwords in Armenian,* Festschrift for Prof. Oswald Szemerényi, ed. Bela Brogyanyi, Amsterdam 1979, 213–28.
Review of J. A. C. Greppin, *Initial Vowel and Aspiration in Classical Armenian. Revue des Etudes Armeniennes* XII (1978–9), 355–64.

HORSFALL, N. M., Horace, *Sermones* 3; *epilegomena, Liverpool Classical Monthly* 4 (1979), 169–71.

Review of R. G. Austin, *P. Vergili Maronis, Aeneidos Liber VI;* K. W. Gransden, *Vergil, Aeneid VIII*; W. R. Johnson, *Darkness Visible: a study of Virgil's Aeneid*; A. Thornton, *The living universe: gods and men in Virgil's Aeneid. Journal of Roman Studies* 69 (1979), 231–4.

Review of C. J. Fordyce, *P. Vergili Maronis, Aeneidos Libri VII–VIII. Classical Review* 29 (1979), 219–23.

IRELAND, R. I., *anonymi auctoris libellus de rebus belicis/A treatise by an unknown author on military matters,* ed., trans., commentary, (Oxford) 1979.

SHARPLES, R. W., Lucretius' account of the composition of the soul (3.231ff.), *Liverpool Classical Monthly* 5 (1980), 117–20.

SKUTSCH, O., Lygdamus I.17ff., *Zeitschrift für Papyrologie und Epigraphik* 34 (1980), 168.

Catullus 58.4-5, *Liverpool Classical Monthly* 5 (1980), 21.

Review of M. Bandiera, *I frammenti del I libro degli Annales di Q. Ennio. Gymmasium* 86 (1979), 560–1.

## SCHOOL OF LIBRARY, ARCHIVE AND INFORMATION STUDIES

FOSKETT, D. J., *Introduction to Comparative Librarianship:* 5th Ranganathan Memorial Lectures. Bangalore Sarada Ranganathan Endowment for Library Science, 1979, 52.

Discovery of essence: an enquiry into Comparative Librarianship. *Middle East Studies and Libraries: a Felicitation Volume for Professor J. D. Pearson.* London: Mansell, 1980.

Librarianship and the 'One World'. *Proc. 65th Ann. Conf. Scottish Library Assoc.* Glasgow, Scottish Library Association, 1979.

The University Library in a changing world. *Proc. Meeting of Convocation,* 9 Feb. 1980, 53–8.

McILWAINE, J. H. St J., The study and teaching of Oriental and African bibliography and librarianship in the University of London. *Middle East Studies and libraries; a felicitation volume for Professor J. D. Pearson,* ed. B. C. Bloomfield. London: Mansell, 1980, 141–52.

MERRINGTON, M., (with Blundell, B., Golden, J., Hogarth, J.), *A list of papers and correspondence of Lionel Sharples Penrose (1898–1972).* London: University College, 1979. 90 pp.

VICKERY, B. C., Sviluppo dei sistemi di informazione. *Politica della Documentazione,* Consiglio Nazionale della Ricerche. Rome: Edizioni dell'Ateneo e Bizzarri, 1978, 165–73.

An approach to information science. *Theory and application of information science.* London: Mansell, 1980, 1–44.

VICKERY, B. C., McILWAINE, I. A., Structuring and switching: a discussion of the Broad System of Ordering. *International Forum on Information and Documentation,* 4 (1979), 13–15.

VICKERY, B. C., THOMAS, P. A., Information system dynamics: modelling the impact of online. *Proceedings of Third International Online Information Meeting.* Oxford: Learned Information, 1979, 83–94.

WATSON, A. G., Dated and Datable Medieval Manuscripts in the Bodleian Library. *Manuscripts at Oxford: an exhibition in memory of Richard William Hunt (1908–1979),* ed. A. C. de la Mare and B. C. Barker-Benfield. Oxford: Bodleian Library, 1980, 136–9.

## PHILOSOPHY

BUDD, M. J., The repudiation of emotion: Hanslick on music. *Brit. J. Aesthetics,* 20 (1980), 29–43.

COHEN, G. A., Capitalism, freedom and the proletariat. *The Idea of Freedom: Essays in Honour of Isaiah Berlin,* ed. A. Ryan. Oxford University Press, 1979, 9–25.

Karl Marx and the withering away of social science. *Marx, Justice and History,* ed. M. Cohen, T. Nagel, T. Scanlon. Princeton University Press, 1980, 288–309.

The Labour theory of value and the concept of exploitation. *Philosophy and Public Affairs.* 8 (1979), 338–60.

Reprinted in *Marx, Justice and History,* ed. M. Cohen, T. Nagel and T. Scanlon. Princeton University Press, 1980, 135–57.

Functional explanation: reply to Elster. *Political Studies,* xxviii (1980), 129–35.

HART, W. D., Causation and self-reference. *Papers on Language and Logic,* ed. J. Dancy. Keele University Library, 1980, 71–87.

HEINAMAN, R. E., Aristotle's tenth Aporia. *Archiv für Geschichte der Philosophie,* 61 (1979), 249–70.

An argument in *Metaphysics* Z13. *Classical Quarterly,* xxx (1980), 72–85.

HONDERICH, TED., *Violence for Equality: Inquiries in Political Philosophy,* London: Pelican Books, 1980, 223 pp.

Critical notice. Anthony Kenny's *Will, Freedom and Power* and *Freewill and Responsibility.,Mind,* lxxxix (1980) 121–33.

ISHIGURO, HIDE, Substances and individual notions. *The Philosophy of Nicholas Rescher: Discussions and Replies,* ed. E. Sosa. Dordrecht: Reidel, 1979, 125–37.

(in Japanese) Pre-established harmony versus constant conjunction *Modes of Epistemology,* ed. Tetsugakkai. Tokyo: Yūhikaku, 1979, 1–27.

The primitiveness of the concept of a person. *Philosophical Subjects: Essays in Honour of Peter Strawson,* ed. Z. Van Straaten. London: Oxford University Press, 1980, 62–75.

Possibility. *Suppl. Proc. of the Aristotelian Soc.,* lxxx (1980), 73–87.

McGINN, C., Truth and use. *Reference, Truth and Reality,* ed. M. Platts. London: Routledge and Kegan Paul, 1980, 19–40.

Operators, predicates and truth theory. *Reference, Truth and Reality,* ed. M. Platts. London: Routledge and Kegan Paul, 1980, 199–205.

Functionalism and phenomenalism: a critical note. *Australasian Journal of Philosophy,* 58 (1980), 35–46.

Philosophical materialism. *Synthèse,* 44 (1980), 173–206.

WOLLHEIM, RICHARD, Wish-fulfilment. *Rational Action: Studies in Philosophy and Social Science,* ed. R. Harrison. Cambridge University Press, 1979, 47–60.

John Stuart Mill and Isaiah Berlin: the ends of life and the preliminaries of morality. *The Idea of Freedom: Essays in Honour of Isaiah Berlin,* ed. A. Ryan. Oxford: Oxford University Press, 1979, 253–69.

Memory, experiential memory and personal identity. *Perception and Identity: Essays presented to A. J. Ayer with his Replies to them,* ed. G. Macdonald. London: Macmillan, 1979, 186–233.

On persons and their lives. *Explaining Emotions,* ed. A. O. Rorty. London, Berkeley and Los Angeles: University of California Press, 1980, 299–321.

Adrian Stokes: Critic, Painter, Poet. *P. N. Review 15,* 7 (1980), 31–7.

## PHONETICS AND LINGUISTICS

BALDWIN, J. R., *A Formal Analysis of the Intonation of Modern Colloquial Russian. Forum Phoneticum 18.* Hamburg: Helmut Buske, 1979, 230 pp.

Phonetics and speaker identification. *Med. Sci. Law,* 19 (1979), 231–2.

DERBYSHIRE, D. C., A diachronic explanation for the origin of OVS in some Carib languages. *Work Papers of the S.I.L., Univ. of N. Dakota Session,* 23 (1979), 36–46.

DERBYSHIRE, D. C., PULLUM, G. K., Object initial languages. *Ibid.,* 1–34.

A select bibliography of Guiana Carib languages. *Int. J. Amer. Ling.,* 45 (1979), 271–6.

FOURCIN, A. J., Speech pattern audiometry. *Auditory Investigation: the Scientific and Technological Basis,* ed. H. A. Beagley. Oxford: Clarendon Press, 1980, 170–208.

(with Joy, D. and others), Design of educational facilities for deaf children. *Brit. J. Audiol.,* Supp. 3, 1980, 24 pp.

FOURCIN, A. J., ROSEN, S. M., DOUEK, E. E., (and others), External electrical stimulation of the cochlea: clinical psychophysical, speech-perceptual and histological findings. *Brit. J. Audiol.,* 13 (1979), 85–107.

FRY, D. B., The singer and the auditorium. *J. Sound Vib.,* 69 (1980), 139–42.

(with Kalmus, H.), On tune deafness (dysmelodia): frequency, development, genetics and musical background. *Ann. Hum. Genet. Lond.,* 43 (1980), 369–82.

GIMSON, A. C., *Introduction to the Pronunciation of English,* 3rd ed. London: Edward Arnold, 1980. 352 pp.

The pronunciation of British English. *Dictionary of the English Language.* London: Collins, 1979, xix–xxi.

HUDSON, R. A., *Sociolinguistics.* Cambridge University Press, 1980. 250 pp.

PULLUM, G. K., Good grammar: is it really necessary? *Times Higher Ed. Supp.,* 11 Jan. 1980, 12.

(with Borsley, R. D.), Comments on the two central claims of 'trace theory'. *Linguistics* 18 (1980), 73–104.

(with Postal, P. M.), On an inadequate defence of 'trace theory'. *Linguistic Inquiry,* 10 (1979), 689–706.

SMITH, N. V., Review article on W. Lehmann (ed.), *Syntactic Typology. J. Linguistics,* 16 (1980), 150–64.

SMITH, N. V., WILSON, DEIRDRE, *Modern Linguistics: the Results of Chomsky's Revolution.* Reprinted Brighton: Harvester Press, 1980; Bloomington: Indiana University Press, 1980, 334 pp.

WASON, P. C., On writing scientific papers. Reprinted in *The Psychology of Written Communication,* ed. J. Hartley. London: Kogan Page, 1980, 248–51.

Novelty and tradition in cognitive research: a case study. *Italian J. Psychol.,* 6 (1979), 1–7.

(with Brooks, P. G.), THOG: the anatomy of a problem. *Psychol. Res.,* 41 (1979), 79–90.

(with Reich, S. S.), A verbal illusion. *Quart J. exp. Psychol.,* 31 (1979), 591–7.

(with Stainton-Rogers, W.), The art of course angling. *Times Higher Ed. Supp.,* no. 395 (23 May 1980), 15.

WELLS, J. C., Final voicing and vowel length in Welsh. *Phonetica,* 36 (1979), 344–60.

WILSON, DEIRDRE, Intensional isomorphism and natural language sentences. *Intention and Intentionality: Essays in Honour of G. E. M. Anscombe.* Brighton: Harvester Press, 1979, 179–93.

## POLITICAL ECONOMY

CARLSON, J. A., Expected inflation and interest rates. *Economic Inquiry,* 17 (1979), 597–608.

(with Frew, J.), Money demand responsiveness to the rate of return on money: a methodological critique. *J. of Political Economy,* 87 (1980), 598–607.

CHICK, V., Transnational corporations and the evolution of the international monetary system. *Transnational Banking and the World Economy,* ed. G. J. Crough. University of Sydney, 1979, 129–78.

HEADY, C. J., (with Mitra, P. K.), The computation of optimum linear taxation. *Rev. of Economic Studies,* 47 (1980), 567–85.

HENDERSON, P. D., The Role and Purpose of Public Enterprise. *The Prime Mover of Progress: The Entrepreneur in Capitalism and Socialism,* London: Institute of Economic Affairs, 1980, 101–110.

Survival, Development and the Report of the Brandt Commission. *The World Economy,* 3, 1 (June 1980), 87–117.

MARKANDYA, A., Optimum towns and environmental externalities. *J. of Economic Theory,* 21 (1979), 445–64.

SPRAOS, J., The theory of deteriorating terms of trade revisited. *Greek Economic Rev.,* 1 (1979), 15–42.

The statistical debate on the net barter terms of trade between primary commodities and manufactures. *Economic J.,* 90 (1980), 107–28.

ULPH, D. T., (with Hare, P. G.), The welfare economies of public and private education. *Contemporary Economic Analysis,* ed. D. Currie and W. Peters, London: Croom Helm, 1980.

On education and distribution, *J. of Political Economy,* 87 (1979), 193–212.

(with Hemming, R.), Uncertain lifetime, imperfect insurance markets and the valuation of pension wealth. *Rev. of Economic Studies,* 47 (1980), 587–93.

## SCANDINAVIAN STUDIES

FOOTE, P. G., Gabriel Turville-Petre 1908–1978. *Proc. Brit. Acad.* LXIV (1978), 467–81.

Lítil samantekt um menningu og meinsemdir, eða fælisaga um fælisótt. *Akademiske Afhandlinger. Festskrift til Karen og Preben.* Privately printed, Odense 1979, 16.

Review of Erik Moltke, *Runerne i Danmark og deres oprindelse. [Dansk] Historisk Tidsskrift* 79 (1979), 392–7.

(ed. with Bekker-Nielsen, H., Haarder, A., Meulengracht-Sørensen, P.), *Medieval Narrative. A Symposium.* Odense University Press 1979. 139 pp.

FOOTE, P. G., PERKINS, R. M., (with Dennis, A.), *Laws of Early Iceland. Grágás* I. University of Manitoba Icelandic Studies, Vol. III. University of Manitoba Press, Winnipeg 1980. vi + 279 pp.

PETHERICK, KARIN, Hjalmar Bergman; Hjalmar Gullberg; Karin Boye. *Essays on Swedish Literature. From 1880 to the Present Day* (ed. Scobbie, I.), Aberdeen 1979, 82–99, 135–44.

POPPERWELL, R. G., Knut Hamsun's 'Livet ivold'. *Proc. 12th Study Conf. Internat. Assoc. Scandinavian Studies 1978* (Helsinki 1979), 211–18.

Ibsen's female characters. *Scandinavica* 19 (1980), 5–12.

THOMAS, MAUREEN, *Icelandic. An introductory course.* Department of Scandinavian Studies, University College London, 1979. 68 pp. and 7 cassettes.

## SPANISH AND LATIN AMERICAN STUDIES

CUMMINS, J. S., Two Missionary Methods in China: Mendicants and Jesuits (Revised). *España en Extremo Oriente,* ed. Victor Sánchez, C. S. Fuertes. Madrid: Editorial Cisneros, 1979, 33–108.

FISHBURN, E., The Concept of 'Civilization and Barbarism' in Sarmiento's 'Facundo' – A Reappraisal. *Ibero-Amerikanisches Archive N.F.,* Year 5, No.4 (1979), 301–8.

GARCIA, A. M., La cólera de Vicente Espinel y la paciencia de Marcos de Obregón. *La Picaresca. Orígenes, textos y estructuras,* M. Criado del Val. Madrid: Fundación universitaria española, 1979, 609–18.

HENN, D. F., La gran ciudad falsa: *Cinelandia* de Ramón Gómez de la Serna. *Cuadernos Hispanoamericanos,* Núm. 350 (1979), 377–87.

TORRENTS, N., Doris Lessing Interviewed: Nos habita lo oscuro. *La Letra y la Imagen,* 27 (1980), 6–7.

Iris Murdoch o la tradicion liberal. *La Calle,* 93 (1980), 44–7.

Latin American Political Cinema. *British Universities Film Council Newsletter,* 37 (1979), 3–5.

## *FACULTY OF LAWS*

BUTLER, W. E., *Collected Legislation of the Union of Soviet Socialist Republics and Constituent Union Republics.* Dobbs Ferry, N.W: Oceana Publications, 1979–80 vol.3 (Studies on Socialist Legal Systems, Faculty of Laws, University College London.)

*International Law in Comparative Perspective,* ed. Alphen aan den Rijn, Sijthoff & Noordhoff, 1980, vii, 315 pp.

*Russian and Soviet Law (Including Foreign and International Law) Microfiche Project: Supplement,* ed. Zug, Switzerland: IDC, 1980. vi, 22, iv pp.

*Soviet and Commerical and Maritime Arbitration,* comp. and ed. Dobbs Ferry, N.Y: Oceana Publications, 1980. vol. 1.

The Advocate in the Mongolian People's Republic. *Review of Socialist Law,* VI (1980), 193–7.

(Editor), Anglo-American Research on Soviet Approaches to Public International Law. *International Law in Comparative Perspective,* 169–90.

*Constitution of the Mongolian People's Republic. Constitutions of the Communist World,* ed. W. B. Simons. Alphen aan den Rijn: Sijthoff & Noordhoff, 1980, 254–81.

Foreword. G. P. Smith, *Restricting the Concept of Free Seas: Some Modern Maritime Law Re-Evaluated.* Huntington, N.Y: Krieger, 1980, 1–3.

(Editor). International Law and the Comparative Method. *International Law in Comparative Perspective,* 25–40.

(Editor). Introduction. *International Law in Comparative Perspective,* 1–10.

The Legal Framework of Mongolian Foreign Trade. *Journal of World Trade Law,* 329–345.

Legal Education and Research in the Mongolian People's Republic: A Note. *Osteuropa Recht,* XXVI (1980), 117–8.

Mongolian Court Organisation. D. Sangidanzan, *Courts of the Mongolian People's Republic (Historical Notes).* London, 1980, vii–xix (Studies on Socialist Legal Systems, Faculty of Laws, University College London).

Some Reflections on the Soviet Advokatura: Its Situation and Prospects. *Soviet Law After Stalin: Soviet Institutions and the Administration of Law,* ed. D. Barry, F. Feldbrugge, G. Ginsburgs, P. Maggs. Alphen aan den Rijn: Sijthoff & Noordhoff 1979, 239–43.

Soviet International Legal Education and 'Stability of Laws': The Syllabus of 1938. *Journal of International Law and Politics,* XII (1979), 31–57.

Soviet Law After Stalin. *Journal of International Politics,* XI (1979), 581–8.

Soviet Union. *Pinner's World Unfair Competition Law.* Alphen aan den Rijn: Sijthoff & Noordhoff, 1979–80. vols. 2–4.

Statute on the College of Mongolian Advocates. *Review of Socialist Law,* VI (1980), 209–16.
Yakov Smirnov and the Law of Nations. *Oxford Slavonic Papers,* XII (1979), 40–5.
CHENG, B., The Role of Law in Society: East and West, National and International. *Chinese University Bulletin,* (1978), 15–18.
Fifty Years of the Warsaw Convention: Where do we go from here? Prolegomena to an Integrated System of Aviation Liability. *Zeitschrift für Luft – und Weltraumrecht.* (4/1979), 373–83.
La Convention de Varsovie fete son cinquantieme anniversaire: Comment s'annonce l'avenir? *Annals of Air and Space Law,* IV (1979), 11–27.
DENNIS, I. H., Duress, Murder and Criminal Responsibility. *Law Quarterly Review,* 96 (1980), 208–38.
FREEMAN, M. D. A., (with Spencer, Sarah), The State, The Law and Race Relations in Britain Today. *Current Legal Problems,* 32 (1979), 117–42.
Milgram's Obedience to Authority – Some Lessons for Legal Theory. *The Liverpool Law Review,* (1979), 45–61.
The Lewisham Case, *Adoption and Fostering,* 97 (1979), 31–6.
*Children – Protected or Abused? Part I – Child Abuse,* Justice for Children, London, 1980, 11 pp.
*Children – Protected or Abused? Part II – Towards Children's Rights,* Justice for Children, London, 1980, 11 pp.
(with Lyon, Christina M.), Towards a Justification of Rights of Co-habitees. *New Law Journal,* 130 (1980), 228–31.
Short, Sharp Shocks – a Comment. *New Law Journal,* 130 (1980), 28–9.
The Criminal Injuries Compensation Scheme and the Family – A Comment on the Revised 1979 Scheme. *Family Law,* 10 (1980), 37–9.
Children's Rights – Some Unanswered Questions and Some Unquestioned Answers. *Poly Law Review,* 5 (1979), 9–19.
Rules and Discretion in Local Authority Social Services Departments: The Children and Young Persons Act 1963 Section 1 in Operation. *Journal of Social Welfare Law,* 2 (1980), 84–95.
Thoughts on Child Custody Adjudication for the 1980s. *Justice of the Peace,* 144 (1980), 77–80.
The Rights of Children and the Closure of Children's Homes. *Justice of the Peace,* 144 (1980), 38–9.
Children of the State: What Rights Should They Have? *Justice of the Peace,* 144 (1980), 289–93.
How Fares Who Cares? A Legal Perspective on the Rights of Children in Care. *National Council of Voluntary Child Care Organisations Newsletter No. 29* (1980) 8–12.
*The Child Care and Foster Children Acts 1980,* Current Law Statutes Reprints. London: Sweet and Maxwell, 1980. vii pp.
Family and Divorce. *The Which? Guide to your Rights.* London: Consumers' Association and Hodder and Stoughton, (1980), 124–41.
Family Violence: Interpretations and Solutions. *Psychology and Legal Processes,* ed. Sally Lloyd-Bostock. London: Macmillan, 1980, 165–81.
Children's Education and the Law I – Parents' Rights: II – Parents' Duties. *Legal Action Bulletin* (1980), 61–3, 135–8.
What Rights and Duties Do Parents Have? *Justice of the Peace,* 144 (1980).
*Violence in the Home:* A Socio-Legal Study, Farnborough, Hants: Gower Publishing Co. Ltd., 1980, 257 + ix pp (a reprint with revisions of a book previously published by Saxon House).
*Family Law,* London: Sweet and Maxwell, 1980. 90 + vi pp.

GUEST, S. F. D., Legal Education and Legal Theory. *Current Legal Problems,* 32 (1979), 179–97.

Revolution and the Position of the Judiciary. *Public Law* Summer (1980), 168–83.

IVAMY, E. R. H., *General Principles of Insurance Law* (4th ed.). London: Butterworths, 1979, 891 pp.

*Marine Insurance* (3rd ed.). London: Butterworths, 1979, 588 pp.

*Casebook on Carriage by Sea* (4th ed.). London: Lloyd's of London Press Ltd., 1979. 148 pp.

JOWELL, J. L., (with Dutheil de la Rochere, J.), Les juges et le controle de l'administration en Grande-Bretagne. *Revue de Droit Public,* (1979), 1059–82.

*Lord Denning, the Courts and the Administration. The Listener,* (22 May 1980), 644–5.

Motorway Planning and Administrative Justice. *Planning* (6 June 1980), 8.

Lords Creating Law. *The Listener,* (25 October 1979), 564–6.

The Enforcement of Laws against Sex Discrimination in England: Problems of Institutional Design. *Equal Employment Policy for Women,* ed. R. S. Ratner. Philadelphia: Temple University Press, 1980.

KORAH, V., Restrictive Trade Practices – Section Editorials. *Journal of Business Law,* (1979), 291–7, 382–93.

Investigations under Regulation 17 – Production of Documents. *Law Society's Gazette,* 77, 1980, 577.

Competition – Section Editorials. *Journal of Business Law,* (1980), 195; 202.

Commission has power to grant interim relief. *European Law Review,* 5 (1980), 135–9.

Interlocutory injunction by High Court to restrain infringement of Article 86. *European Law Review,* 4 (1979), 417–8.

LLOYD OF HAMPSTEAD, LORD, *The Idea of Law* (8th ed.). London: Penguin Books, 1979. 365 pp.

NATHANSON, A. J., D. Sangidanzan's *Courts of the Mongolian People's Republic (Historical Notes).* Trans. London, 1980. 44 pp. (Studies on Socialist Legal Systems, Faculty of Laws, University College London.)

NOBLE, D., Policing Voluntary Housing. *Roof,* 4, 4, (1979), 122–5.

The Committee System. *Roof,* 5, 1, (1980), 20–2.

OLIVER, D., Resisting Compulsory Acquisition of Land. *Journal of Planning and Environment Law,* (1980), 236–43.

RIDEOUT, R. W., *Principles of Labour Law* (3rd ed.). London: Sweet and Maxwell, 1979, li, 464.

*Industrial Tribunal Law,* London: McGraw-Hill, 1980, xix, 199.

ROSE, F. D., *A Manual on Company Law.* London: Chart Tutors Ltd., 1979. 202 pp.

*International Trade.* London: Sweet and Maxwell Ltd., 1979. 88 pp.

*Company Law.* London: Sweet and Maxwell Ltd., 1980. 88 pp.

*Constitutional Law.* London: Sweet and Maxwell Ltd., 1980. 88 pp.

Following Property – Tracing. *Bailment,* ed. N. E. Palmer. Sydney: The Law Book Co., 1979. 155–9.

Carriage of Goods by Sea. *Bailment,* ed. N. E. Palmer. Sydney: The Law Book Co., 1979. 607–30.

An Onflowing Situation. *Law Quarterly Review,* 96 (1980), 177–81.

THOMAS, J. A. C., Sale Actions and Other Actions. *Revue Internationale des Droits de L'Antiquite,* xxvi (1979) 416–35.

WINTER, D., *Contracts with Eastern Europe* (2nd ed.). London: East European Trade Council. 60 pp.

# *FACULTY OF SCIENCE*

## BOTANY AND MICROBIOLOGY

ALAVI, A., STRANGE, R. N., A baiting technique for isolating *Phytophthora drechsleri,* causal agent of crown rot of *Cucumis* spp. in Iran. *Plant Disease Reporter,* 63 (1979), 1084–6.

ARMITAGE, J. P., EVANS, M. C. W., Measurements of membrane potential changes during tactic stimulation of photo-synthetic and non-photosynthetic bacteria using the carotenoid band-shift and oxanol dyes. *Proc. 1st European Bioenergetics Conference,* (1980), 468–570.

Chemotactically induced increase in the membrane potential of spheroplasts of *Rhodopseudomonas spheroides. FEBS Letts.,* 112 (1980), 5–9.

BARFOOT, P. J., TUCKER, J. J., Geomorphological changes at Blakeney Point, Norfolk. *Trans. Norf. & Nor. Nat. Soc.,* 25, 2 (1980), 49–60.

BELL, P. R., Demonstration of succinic dehydrogenase in mitochondria of fern egg cells at electron microscope level. *Histochemistry,* 62 (1979), 85–91.

(with Cave, C. F.), The effect of colchicine on spermatogenesis in a fern, *Pteridium aquilinum* (L.) Kuhn. *Ann. Bot.,* 44 (1979), 407–15.

Nucleocytoplasmic interaction during maturation of the egg of the fern *Histiopteris incisa* (Thunb.) J. Smith. *Ann. Bot.,* 45 (1980), 475–81.

BREARLEY, C., The Evansia Irises. *Quart. Bull. Alpine Garden Soc.,* 48 (1980), 128–31.

ELLIS, J. R., Cultivated *Iris wattii* – a possible hybrid rather than a true species. *Iris Year Book,* (1979), 62–6.

EVANS, M. C. W., RUTHERFORD, A. W., Determination of the redox properties of the primary and secondary electron acceptors in the reaction centre of *Rhodopseudomonas spheroides. Proc. 1st European Bioenergetics Conference,* (1980), 33–5.

Effects of glycerol on the redox properties of the electron acceptor complex in spinach photosystem I particles. *Biochim. biophys. Acta,* 590, (1980), 89–96.

(with Evans, E. H., Rush, J. D., Johnson, C. E.), Mossbauer spectra of photosystem I reaction centres from the blue-green alga *Chlorogloea fritschii. Biochem. J.,* 182, (1980), 861–5.

GOLDSMITH, F. B., An evaluation of a forest resource: a case study from Nova Scotia. *J. Env. Man.,* 10, (1980), 83–100.

HEATHCOTE, P., EVANS, M. C. W., Properties of the e.p.r. spectrum of the intermediary electron acceptor (A1) in several different photosystem I particle preparations. *FEBS Letts.,* 111, (1980), 51–6.

HOOPER, M. D., (with Warren, A., Hollis, G. E., Wood, J. B., Fisher, R. C.), Ichkeul: The Problems of a Wet Park in a Dry Country. *Parks,* 4, (1979), 6–10.

HYAMS, J. S., The formation and breakdown of nutritive tubes – massive microtubular organelles associated with cytoplasmic transport. *J. Ultrastruct. Res.,* 68 (1979), 46–57.

(with Roberts, K.) (Editors). *Microtubules.* London: Academic Press, 1979, 595 pp.

(with Stebbings, H.), Microtubule associated cytoplasmic transport. *Microtubules,* ed. K. Roberts, J. S. Hyams. London: Academic Press, 1979, 487–530.

JACKSON, M. J., (with James, R.), The influence of bait-digging on cockle *(Cerastoderma marina* L.) populations in north Norfolk. *J. Appl. Ecol.,* 16 (1979), 671–9.

NUGENT, J. H. A., EVANS, M. C. W., E.p.r. signals of cytochromes in subchloroplast particles. *FEBS Letts.,* 12 (1980), 1–4.

PINDER, N. J., A Policy for Faunal Reintroductions. *Discussion Papers in Conservation,* 23, London: U.C.L., 1979, 28 pp.

ROSE, C. J., Nature Conservation and Species Introductions. *Discussion Papers in Conservation,* 26, London: U.C.L., 1979, 47 pp.

ROWBURY, R. J., (with Pritchard, J. J., Rodriguez Lemoine, V.), Factors influencing the copy of F-like plasmids in *Escherichia coli* and *Salmonella typhimurium. Zeit für Allg. Mikrobiol.,* 19 (1979), 563–70.

(with Pritchard, J. J.), Host components required for the replication of the resistant plasmid R124 and a copy mutant derivative. *Zeit für Allg. Mikrobiol.,* 20 (1980) 129–40.

RUTHERFORD, A. W., EVANS, M. C. W., The high potential semi-quinone-iron signal in *Rhodopseudomonas viridis* is the specific quinone secondary electron acceptor in the photo-synthetic reaction centre. *FEBS Letts.,* 104 (1979), 227–30.

Direct measurement of the redox potential of the primary and secondary quinone electron acceptors in *Rhodopseudomonas spheroides* by e.p.r. spectrometry. *FEBS Letts.,* 110 (1980) 257–61.

SHEFFIELD, E., BELL, P. R., Ultrastructural aspects of sporogenesis in a fern, *Pteridium aquilinum* (L.) Kuhn. *Ann. Bot.,* 44 (1979), 393–405.

(with Cawood, A. H., Dickinson, H. G.), The development of nuclear vacuoles during meiosis in plants. *Planta,* 146 (1979), 597–601.

SMITH, D. G., (with Brown, T. A.), The reduction of tellurate and tellurite by *Cryptococcus albidus. Microbios. Letts.,* 7 (1979), 121–5.

Effects of inorganic selenium compounds on growth, cell size, and ultrastructure of *Cryptococcus albidus. Microbios. Letts.,* 10 (1979), 55–62.

(with Srivastava, K. C.), Isolation and chemical composition of yeast extracellular capsule. *Rev. Microbiol. (S. Paulo),* 10 (1979), 157–60.

Growth and survival studies of psychrophilic and mesophilic yeasts. *Microbios.,* 25 (1979), 45–62.

The fine structure of psychrophilic and mesophilic *Rhodotorula rubra. Cytobios.,* 26 (1979), 57–66.

STRANGE, R. N., (with Khan, S. R.), Susceptibility of jute to anthracnose correlated with the concentration of synergistic fungal growth factors in the host. *Third International Congress on Phytopathology, München,* (1978), 258.

TAYLOR, K., The growth of *Rubus vestitus* in a mixed deciduous woodland. *J. Ecol.,* 68 (1980), 51–62.

WHITE, D. J. B., The effects of the storm of 11 January 1978 on Blakeney Point. *Trans. Norf. Norw. Nat. Soc.,* 25, 1, (1979), 267–9.

WILKIE, D., (with Diala, E. S., Mittwoch, U.), Comparative antimitochondrial activity of thioacetamide and ethylenethioursea in human and yeast cell cultures. *Brit. J. Canc.,* 42 (1980), 112–20.

# CHEMISTRY

AKHILA, A., BANTHORPE, D. V., The biosynthetic origin of the gem-methyls of geraniol. *Phytochemistry*, 18 (1980), 1429–31.

(with Rowan, M. G.), Biosynthesis of carvone in Mentha spicata. *Phytochemistry*, 18 (1980), 1433–7.

ANDERSON, J. E. (with Franck, R. W.), The effect of alkyl groups on the thermal rearomatisation of hindered hemi-Dewar naphthalenes. *Nouv. J. Chim.*, 3 (1979), 717–8.

ANDERSON, S. N., COOKSEY, C. J., HOLTON, S. G., JOHNSON, M. D., Substitution and cleavage in the reaction of some benzyl(carbonyl)metal complexes with trifluoroacetic acid. *J. Amer. chem. Soc.*, 102 (1980), 2312–8.

AZAM, K. A., DEEMING, A. J., ROTHWELL, I. P., Double oxidative addition reactions of aldehydes and ketones at triosmium clusters. *J. organometallic Chem.*, 178 (1979), C20–2.

BABAN, JEHAN A., COOKSEY, C. J., ROBERTS, B. P., An elctron spin resonance study of radical addition to vinylphosphines. *J. chem. Soc. Perkin II*, (1979) 781–7.

BABAN, JEHAN A., ROBERTS, B. P., Ligand-σ phosphoranyl radicals. *J. chem. Soc. chem. Comm.*, (1979), 537–9.

BANTHORPE, D. V. (with Charlwood, B. V.), Biosynthesis of terpenoids. *Secondary Plant Products*, ed. E. A. Bell, B. V. Charlwood. Berlin: Springer-Verlag, 1980, 185–220.

BANTHORPE, D. V., POOTS, I., Redox interconversions of geraniol and nerol in Rosa damascena. *Phytochemistry*, 18 (1979), 1297–9.

BARKER, P. J., DAVIES, A. G., Deuterium isotope effect on the electron spin resonance spectrum of the cyclopentadienyl radical. *J. chem. Soc. chem. Comm.*, (1979), 815–6.

BARKER, P. J., DAVIES, A. G., FISHER, J. D., The electron spin resonance spectra and the structures of substituted cyclopentadienyl radicals. *J. chem. Soc. chem. Comm.*, (1979), 587–8.

BARKER, P. J., DAVIES, A. G., HAWARI, J. A. A., Electron spin resonance spectra and structures of the butylchlorotin derivatives of butane-2,3-semidione, $Bu_nCl_{3-n}SnOCMeCMeO\cdot$. *J. organometallic Chem.*, 187 (1980), C7–10.

BARKER, P. J., DAVIES, A. G., TSE, M.-W., The photolysis of cyclopentadienyl compounds of tin and mercury. Electron spin resonance spectra and electronic configuration of the cyclopentadienyl. deuteriocyclopentadienyl, and alkylcyclopentadienyl radicals. *J. chem. Soc. Perkin II*, (1980), 941–8.

BEVAN, J. W., LEGON, A. C., MILLEN, D. J., ROGERS, S. C., Spectroscopic investigations of hydrogen bonding interactions in the gas phase. II. The determination of the geometry and potential constants of the hydrogen-bonded heterodimer $CH_3CN \cdots HF$ from its microwave rotational spectrum. *Proc. Roy. Soc. London, A*, 370 (1980), 239–55.

BILYARD, K. G., FARRATT, P. J., ZAHLER, R., Dimetallated vicinal diesters. Reaction with α, ω-dihalides and ditosylates. A new method of annelation for the preparation of bicyclo[x, y, O]alkenes. *Synthesis*, (1980), 389.

BLACKBOROW, J. R., CLIFFORD, D. P., HOLLINSHEAD, I. M., MODRO, T. A., RIDD, J. H., WORLEY, M. C., The kinetics of hydrogen-isotope exchange at the nitrogen atom of substituted anilinium ions. Part I. The acid-catalysed reaction. *J. chem. Soc. Perkin II*, (1980), 632–6.

BLOODWORTH, A. J., EGGELTE, H. J., Simple conversion of cycloalkenes into bromo-substituted prostanoid endoperoxides (dioxabicyclo[*n*.2.1]alkanes). *J. chem. Comm.*, (1979), 741–2.

Conversion of 3-cyclopentenyl hydroperoxide into 5-substituted-2,3-dioxabicyclo-[2.2.1]heptanes. *Tetrahedron Letters*, (1980), 2001–4.

BLOODWORTH, A. J. (with Adam, W.), Organic peroxides, biological, and synthetic aspects. *Ann. Reports (B)*, London: The Chemical Society, 1978, 342–69.

BLOODWORTH, A. J. (with others), Photoelectron spectra of bicyclic peroxides. *J. Electron Spectrosc. Rel. Phen.*, 19 (1980), 223–30.

BLUM, P. M., DAVIES, A. G. (with Pereyre, M., Ratier, M.), The ring-opening of *trans*-1-methyl-2-vinylcyclopropane induced by homolytic attack at the double bond. *J. chem. Research*, (s) (1980), 100; (m) (1980), 1174–89.

BURY, A., COOKSEY, C. J., FUNABIKI, T., GUPTA, B. D., JOHNSON, M. D., Homolytic displacement at carbon centres. Part 1. Reaction of allyl and allenyl-cobaloximes with polyhalogenomethanes. *J. chem. Soc. Dalton*, (1979), 1050.

BURY, A., JOHNSON, M. D., Intramolecular homolytic displacement of bromine atoms from carbon in the reaction of but-3-enyl bromides with radicals. *J. chem. Soc. chem. Comm.*, (1980), 498.

BURY, A., JOHNSON, M. D., SELLARS, P. J. (with Atkins, M. P., Golding, B. T.), $\zeta^3$-Homoallylcobalt complexes in the intramolecular rearrangements of but-3-enylcobaloximes. *J. Amer. chem. Soc.*, 102 (1980), 3630.

BUTINA, D., SONDHEIMER, F., Synthesis of 1-cyclopentene-1,2-dicarboxaldehyde and 1-cyclobutene-1,2-dicarboxaldehyde. *Synthesis*, (1980), 543–4.

CALLOMON, J. H., Marine boreal Bathonian fossils from the northern North Sea and their palaeogeographical significance. *Proc. geol. Ass.*, 90 (1979), 163–9.

(with Birkelund, T.), A comparison of the Upper Jurassic–Lower Cretaceous sequences of Andoya, northern Norway, and Milne Land, East Greenland. *The Upper Jurassic and the boundary of the Cretaceous System*, ed. V. N. Saks and A. L. Yanshin. Novosibirsk: Akad. Nauk SSSR, Sib. otdel., 1979, 34–5 (in Russian).

The Jurassic transgression and the mid-late Jurassic succession in Milne Land, central East Greenland. *Geol. Mag.*, 117 (1980), 211–26.

(with Sykes, R. M.), The *Ameoboceras* zonation of the Boreal Upper Oxfordian. *Palaeontology*, 22 (1979), 839–903.

CAMPBELL, J. R., CLARK, R. J. H., (with Clore, G. M., Lane, A. N.), Characterisation of the electronic properties and geometric environment of the iron atom in the myoglobin hydrogen-peroxide complex by Soret-excited resonance Raman spectroscopy. *Inorg. chim. Acta*, 46 (1980), 77–84.

CARDOSO, A., CLARK, R. J. H., MOORHOUSE, S., Synthesis of monocyclopentadienyltricarbonyl-niobium (and -tantalum) dichlorides. *J. organometallic Chem.*, 186 (1980), 237–40.

Synthesis of early transition-metal complexes containing metal-silicon bonds. *Ibid.*, 241–5.

Reactions of trimethylsilylcyclopentadiene derivatives with titanium, niobium and tantalum halides. *J. chem. Soc. Dalton*, (1980), 1156–60.

CATLOW, C. R. A., Long range ordering of shear-planes in non-stoichiometric oxides. *Modulated Structures*, ed. J. B. Cowley. New York: American Physical Society, 1979, 237–49.

Structure and transport in superionic fluorites. *Comments on Solid State Physics*, IX (1980), 157–68.

Redox reaction and dopants in uranium dioxide. *Proc. IAEA Workshop on Chemical Effects in Irradiated Reactor Fuels*. Erlangen, Germany, January 1979, 168–72.

(with Diller, K. M., and Hobbs, L. W.), Radiation damage in alkali halide crystals. *Phil. Mag.* A42 (1980), 193–210.

(with Corish, J., and Jacobs, P. W. M.), Calculation of the Frenkel defect formation. Energy in silver chloride. *J. Phys. C.*, 12, (1979), 3433–45.

Defect properties of silver chloride. *Fast Ion Transport in Solids*, ed. P. Vashishta. Amsterdam: Elsevier-North Holland, 1979, 589–92.

(with Corish, J., Quigley, J. M., and Jacobs, P. W. M.), A theoretical study of alkaline earth cations in crystalline sodium chloride, potassium bromide, and potassium chloride. *J. Phys. Chem. Solids*, 41 (1980), 231–42.

(with MacInnes, D. A.), The specific heat anomaly in crystalline $UO_2$. *J. Nucl. Materials*, 89 (1980), 354–8.

(with Mackrodt, W. C., Norgett, M. J., and Stoneham, A. M.), The basic atomic processes of corrosion. II. Defect structures and cation transport in transition metal oxides. *Phil. Mag.*, A40 (1979), 161–72.

CATLOW, C. R. A., and WALKER, J. R., Defect properties and ion transport in lithium nitride. *Fast Ion Transport in Solids*, ed. P. Vashishta, Amsterdam: Elsevier-North Holland, 1979, 491–4.

CHAPMAN, C. A., PEARCE, F. L., VERNON, C. A. (with Banks, B. E. C., and Carstairs, J. R.), The preparation of nerve growth factor from the prostate of the guinea pig and isolation of immunogenically pure material from the mouse submandibular gland. *FEBS Letts*, 105 (1979), 341–4.

CHAPMAN, M. D., DOONAN, S. (with Barry, F. P., Ross, C. A.), Cleavage of trypsin at N-ε-formyl-lysine residues. *Biochem. Soc. Trans.*, 7 (1979), 519–21.

CHOTHIA, C. (with Lesk, A. M.), How different amino acid sequences determine similar protein structures: the structure and evolutionary dynamics of the globins. *J. Mol. Biol.*, 136 (1980), 223–68.

(with Lesk, A. M.), Protein evolution and helix packing in the globins. *Protein Folding*, ed. M. Balaban, R. Jaenicke. Amsterdam: Elsevier-North Holland, 1980, 63–77.

Concluding Remarks. *Protein Folding*, ed. M. Balaban, R. Jaenicke. Amsterdam: Elsevier-North Holland, 1980, 583–5.

CLARK, R. J. H. ed., *Trace chemistry of aqueous solutions*, by P. Benes and V. Majer. Amsterdam: Elsevier, 1980, 252 pp. The application of resonance Raman spectroscopy to the study of the vibrational and electronic properties of inorganic species. *J. Mol. Struct.*, 50 (1980), 137–45.

(with Hester, R. E.), eds. *Advances in Infrared and Raman Spectroscopy*, vol. 6. London: Heyden, 1980. xv + 355 pp.

(with Hester, R. E.), eds., *Advances in Infrared and Raman Spectroscopy*, vol. 7. London: Heyden, 1980. xv + 384 pp.

CLARK, R. J. H., COBBOLD, D. G., STEWART, B., Resonance Raman excitation profiles for the totally symmetric mode of the permanganate ion. *Chem. Phys. Letters*, 69 (1980), 488–90.

CLARK, R. J. H., DINES, T. J., Resonance Raman spectrum of titanium tetrabromide. *Chem. Phys. Letters*, 64 (1979), 499–502. Raman and resonance Raman studies on the tetraiodides of carbon, silicon, germanium and tin using visible and ultraviolet exciting lines. *Inorg. Chem.*, 19 (1980), 1681–8.

CLARK, R. J. H., SOURISSEAU, C., Electronic, ir, Raman and resonance Raman spectra of the linear trimetallic complexes $[Pd_3(CNCH_3)_8](PF_6)_2$ and $[Pd_3(CNCH_3)_6\{P(C_6H_5)_3\}_2](PF_6)_2$. *Nouveau J. Chim.*, 4 (1980), 287–97.

CREASE, A. E., GUPTA, B. D., JOHNSON, M. D. (with Bialkowska, E., Duong, K. N. V., Gaudemer, A.), Homolytic displacement at carbon centres. Part 3. Regiospecific synthesis of allylsulphones in the reaction of allylcobaloximes with organosulphonyl chlorides. *J. chem. Soc. Perkin I*, (1979), 2611.

CRISP, G. M., WALMSLEY, S. H., Exciton trap depths in orientationally disordered anthracene crystals. *Mol. cryst. liq. cryst.*, 58 (1980), 71–6.

DATTA, N., MONDAL, P., PAULING, P. J., Structure of acetylcholine tetraphenylborate. *Acta cryst.*, B36 (1980), 906–9.

DAVIES, A. G., Free radical reactions. *Ann. Reports Prog. Chem.*, 75B (1979), 70–8.

DAVIES, A. G., HAIG, R., TSE, M.-W., Properties of the β-carboxyalkyltin chlorides: evidence for intramolecular coordination. *J. organometallic Chem.*, 174 (1979), 163–7.

DAVIES, A. G., LUSZTYK, J., The pentamethylcyclopentadienyl radical: generation, electron spin resonance spectrum, and reaction kinetics. *J. chem. Soc. chem. Comm.*, (1980), 554.

DAVIES, A. G., ROBERTS, B. P., Magnetic properties of free radicals. Phosphorus-centred organic radicals. *Landolt-Börnstein, New Series*, 9–C2 (1979), 215–70.

DAVIES, A. G., SUTCLIFFE, R., Acyl radicals: the relationship between electron spin resonance spectra, structure, and stability in a family of σ-radicals. *J. chem. Soc. Perkin II*, (1980), 819–24.

DEEMING, A. J., The reaction of dichlorotetracarbonyldirhodium, $Rh_2Cl_2(CO)_4$, with tertiary butyl isocyanide. *J. organometallic Chem.*, 175 (1979), 105–12.

(with Evans, J.), Organometallic Chemistry. *Annual Reports (A)*, London: The Chemical Society, 1978, 311–63.

DEEMING, A. J., ROTHWELL, I. P., Carbon-hydrogen bond activation in transition metal compounds. *Pure appl. Chem.*, 52 (1980), 649–55.

(with Hursthouse, M. N., Backer-Dirks, J. D. J.), Pyramidal nitrogen atoms in a diquinolyl ring: X-ray crystal structure of ($\eta^3$-allyl)(8,8'-dimethyl-2,2'-diquinolyl)-palladium(II) perchlorate. *J. chem. Soc. chem. Comm.*, (1979), 670–2.

(with Hursthouse, M. B., Malik, K. M. A.), The coordination chemistry of 8-methyl-, 8-ethyl-, and 8-isopropyl-quinoline-2-carboxaldehyde-*N*-methylimine with palladium, rhodium and iridium. Crystal and molecular structure of ($\eta^3$-allyl)-(8-isopropylquinoline-2-carboxaldehyde-*N*-methylimine-*N*, *N*)-palladium(II) perchlorate. *J. chem. Soc. Dalton*, (1979), 1899–911.

DICKER, S. E., MORRIS, CHRISTINE A., Presence of a renotrophic factor in plasma of unilaterally nephrectomized rats. *J. Physiol.*, 299 (1980), 13–27.

Origin of the humoral factor responsible for compensatory renal hypertrophy. *J. Physiol.*, 301 (1980), 1–5.

DOONAN, S. (with others), The effect of sulphydryl group reagents on the permeation of mitochondrial aspartate aminotransferase into mitochondria *in vitro*. *Arch. Biochem. Biophys.*, 195 (1979), 269–79.

DOONAN, S., FAHMY, H. M. A., HUGHES, G. J., (with Barra, D., Bossa, E.), The primary structure of mitochondrial aspartate aminotransferase from pig heart: peptides obtained by cleavage at basic residues. *Ital. J. Biochem.*, 28 (1979), 441–55.

ENNIS, M., PEARCE, F. L., Effect of cyclic AMP on histamine release induced by compound 48/80. *Int. Archs Allergy appl. Immunol.*, 60 (1979), 461–4.

ENNIS, M., PEARCE, F. L., VERNON, C. A., Some studies on the mechanism of action of antibodies to nerve growth factor. *Neuroscience*, 4 (1979), 1391–8.

ENNIS, M., TRUNEH, A., WHITE, J. R., PEARCE, F. L., Calcium pools involved in histamine release from rat mast cells. *Int. Archs Allergy appl. Immunol.*, 62 (1980), 467–71.

EWING, M. B. (with Marsh, K. N.), A differential Burnett apparatus: virial coefficients for argon and neopentane at various temperatures. *J. chem. Thermodynamics*, 11 (1979), 793–810.

GARA, W. B., GILES, J. R. M., ROBERTS, B. P., An electron spin resonance study of the reactions of oxidising radicals with dialkyl sulphides. Radical cations derived from anodic oxidation of $R_2S$, $(R_2N)_2S$, and $(R_2N)_2SO$. *J. chem. Soc. Perkin II*, (1979), 1444–50.

GEORGIOU, A. S., LEGON, A. C., MILLEN, D. J., Spectroscopic investigations of hydrogen bonding interactions in the gas phase. III. The identification of the hydrogen-bonded heterodimer $(CH_3)_3CCN \cdots HF$ and the determination of its

geometry by microwave and infrared spectroscopy. *Proc. roy. Soc. London, A*, 370 (1980), 257–68.

GILES, J. R. M., ROBERTS, B. P., An e.s.r. study of some reactions of acylthiyl radicals. *J. chem. Soc. chem. Comm.*, (1980), 62–4.

HAY, ROBYN, S., ROBERTS, B. P., SINGH, K., WILKINSON, J. P. T., Electron spin resonance studies of radicals derived from trialkyl phosphorimidates, $(RO)_3P{=}NR$. Phosphazene formation by β-scission of an aminophosphoranyl radical. *J. chem. Soc. Perkin II*, (1979), 756–62.

JONES, G. P., PAULING, P. J., Conformations of tetrahydro-2-(non-1-en-3,5,7-triynyl)pyran-3-acetate (cunaniol acetate). Part 1. Crystal and molecular structure of cunaniol acetate (violet modification). *J. chem. Soc. Perkin II*, (1979), 1482–5.

LEGON, A. C. (with others), $^{83}$Kr nuclear quadrupole coupling in KrHF: evidence for charge transfer. *Chem. Phys. Letters*, 70 (1980), 420–4.

LEGON, A. C., MILLEN, D. J., ROGERS, S. C., Spectroscopic investigations of hydrogen bonding interactions in the gas phase. I. The determination of the geometry, dissociation energy, potential constants and electric dipole moment of the hydrogen-bonded heterodimer HCN · · · HF from its microwave rotational spectrum. *Proc. roy. Soc. London, A*, 370 (1980), 213–37.

MACCOLL, A., Concluding remarks. *Phil. Trans. roy. Soc. London, A*, 293 (1979), 167–8.

The use of the term activation energy in mass spectrometry. *Org. Mass Spectrom.*, 15 (1980), 109.

(with Harvey, R.), Detection of formyl radicals in low pressure methane + oxygen flames. *J. chem. Soc. Faraday Trans. I*, 75 (1979), 2423–32.

(with Harvey, R.), The formation of $C_2$ hydrocarbons within methane-oxygen flames. *J. chem. Soc. Faraday Trans. I*, 75 (1979), 857–66.

MACCOLL, A., MRUZEK, M. (with Baldwin, M.), Chlorine kinetic isotope effects. *J. chem. Soc. Faraday Trans. I*, 76 (1980), 838–45.

MATHUR, D. (with Hasted, J. B.), Odd and even numbered hydrogen ion clusters. *Nature*, 280 (1979), 573–4.

(with Hasted, J. B., Khan, S. U.), Collision processes of electrons with molecular hydrogen ions. *J. Phys. B: atom. mol. Phys.*, 12 (1979), 2043–50.

Trap recombination processes of cluster ions. *Electronic and Atomic Collisions*, ed. K. Takayanagi, N. Oda. Tokyo: Society for Atomic Collisions Research (Japan), 1979, 376.

(with others), Collision spectroscopy of doubly-charged nitrogen ions. *Electronic and Atomic Collisions*, ed. K. Takayanagi, N. Oda. Tokyo: Society for Atomic Collisions Research (Japan), 1979, 492.

Energy distribution of drifting ions. *Electronic and Atomic Collisions*, ed. K. Takayanagi, N. Oda. Tokyo: Society for Atomic Collisions Research (Japan), 1979, 854.

McGLASHAN, M. L., *Chemical Thermodynamics*. London: Academic Press. 1979. xix + 345 pp.

MILLS, D. J., RIDD, J. H., The kinetics of hydrogen-isotope exchange at the nitrogen atom of substituted anilinium ions. Part II. The nitrosonium-ion-catalysed reaction. *J. chem. Soc. Perkin II*, (1980), 637–40.

MORGAN, R. P., DERRICK, P. J., LOUDON, A. G., Kinetics and mechanisms of the decomposition of the molecular ions of pentanal and its monomethyl-substituted homologues in the picosecond to microsecond time interval following field ionisation. *J. chem. Soc. Perkin II*, (1980), 306–12.

PAULING, P. J., DATTA, N., Anticholinergic substances: a single consistent conformation. *Proc. nat. Acad. Sci. U.S.A.*, 77 (1980), 708–12.

PEARCE, F. L. (with Carstairs, J. R. and Roberts, M. G.), The effect of increased levels of endogenous nerve growth factor on mouse sympathetic ganglia. *Brain Research*, 177 (1979), 523–32.

(with others), Isolation and characteristics of mast cells from the small bowel lamina propria. *The mast cell, its role in health and disease*, ed. J. Pepys, and A. M. Edwards. Tunbridge Wells: Pitman Medical Publishing Co., 1979, 702–9.

PEARCE, F. L., ENNIS, M., Isolation and some properties of mast cells from the mesentery of the rat and guinea pig. *Agents and Actions*, 10 (1980), 124–31.

PEARCE, F. L., ENNIS, M., TRUNEH, A., WESTON, P. M., WHITE, J. R., Effect of anti-allergic compounds on histamine release induced by basic agents, antigen and the calcium ionophore A23187. *The mast cell, its role in health and disease*, ed. J. Pepys and A. M. Edwards. Tunbridge Wells: Pitman Medical Publishing Co., 1979, 69–75.

ROBERTS, B. P., SINGH, K., Mode of ligand exchange in a cyclic phosphoranyl radical. *J. chem. Soc. chem. Comm.*, (1979), 980–1.

ROBERTS, B. P., WINTER, J. N., An e.s.r. study of spin-trapping by azodicarboxylates to give hydrazyl radicals. *Tetrahedron Letters*, (1979), 3575–8.

Electron spin resonance studies of radicals derived from azides. *J. chem. Soc. Perkin II*, (1979), 1353–61.

SUTOR, D. JUNE, Composition of gallstones. *Gallstones*, ed. M. M. Fisher, C. A. Goresky, E. A. Shaffer, and S. M. Strasberg. New York: Plenum Press, 1979, 19–29.

Epidemiology and composition. *Tutorials in Postgraduate Medicine: Urology*, ed. G. D. Chisholm. London: Heinemann Medical Books, 1980, 95–103.

SUTOR, D. JUNE, PERCIVAL, JOSEPHINE M., DOONAN, S., Urinary inhibitors of the formation of calcium oxalate. *Brit. J. Urol.*, 51 (1979), 253–5.

SUTOR, D. JUNE, WILKIE, LYNETTE I., Measurement of free palmitic acid in human bile. *J. clin. Chem. clin. Biochem.*, 18 (1980), 193–4.

(with Jackson, M. J.), Ionised calcium in pathological human bile. *J. clin. Pathol.*, 33 (1980), 86–8.

THIRUNAMACHANDRAN, T., Intermolecular interactions in the presence of an intense radiation field. *Mol. Phys.*, 40 (1980), 393–9.

(with Power, E. A.), A canonical transformation in neoclassical radiation theory. *Foundations of Radiation Theory and Quantum Electrodynamics*, ed. A. O. Barut, New York: Plenum, 1980, 65–81.

TOBE, M. L., HENDERSON, R., (with others), A conformational study of an isomer of chloropyridine(1,8-diamino-3,6-diazaoctane)-cobalt(III) chloride. *Gazz. chim. Ital.*, 109 (1979), 207–11.

TOBE, M. L., (with others), Crystal and molecular structure of chloro-[1,11-bis(2-pyridyl)2,6,10-triazaundecane]cobalt(III) tetrachlorocobaltate(II) hemihydrate. $[Co(picditn)Cl][CoCl_4]\frac{1}{2}H_2O$. *Inorg. chim. Acta*, 40 (1980), 71–7.

TOCZYLKIN, L. S., YOUNG, C. L., Gas-liquid critical temperatures of mixtures containing electron donors. I. Ether mixtures. *J. chem. Thermodynamics*, 12 (1980), 355–64.

Gas-liquid critical temperatures of mixtures containing electron donors. II. Amine mixtures. *J. chem. Thermodynamics*, 12 (1980), 365–70.

Upper critical solution temperatures of hydrocarbon and fluorocarbon mixtures: mixtures with specific interactions. *Aust. J. Chem.*, 33 (1980), 465.

VERNON, C. A. (with Banks, B. E. C., Carstairs, J. R.), Differing effects on superior cervical ganglia of neonate mice produced by antisera to nerve growth factor from mice and snakes. *Neuroscience*, 4 (1979), 1145–55.

VERNON, C. A. (with Banks, B. E. C., Sinclair, N. M.), The polypeptide components of bee venom. *Proceedings of the Third Symposium on plant, animal, and microbial toxins*, eds. G. Habermehl and D. Mebs, International Society on Toxinology. London, 1979, 65–77.

WALMSLEY, S. H. (with Califano, S., Righini, R.), Quadrupole contributions to lattice vibration frequencies of benzene and naphthalene. *Chem Phys. Letters*, 64 (1979), 491–3.

(with Chandrasekharan, V., Thiéry, M. M.), Comment on: Vibron and lattice frequency shifts in the Raman spectra of solid $\alpha$-$N_2$ and $\gamma$-$N_2$ and librational force constants of diatomic molecular crystals. *J. chem. Phys.*, 71 (1979), 3893–4.

(with others), Phonon dispersion curves and phonon lifetimes in crystalline ammonia. *Chem. Phys.*, 44 (1979), 189–96.

(with Craig, D. P., Dissado, L. A.), Exciton-phonon coupling in molecular crystal trapping processes. *Chem. Phys.*, 46 (1980), 87–105.

WEST, T. F. ed., *Report on desulphurisation techniques*. European Federation of Chemical Engineering, 1980.

(with Green, M. B., Hartley, G. S.), *Chemicals for crop protection and pest control*. Oxford: Pergamon. Reprinted with addendum. 1979. Russian translation. Moscow: Kolos, 1979.

(with T. M. Sugden), eds., *Chlorofluorocarbons in the environment. The aerosol controversy*. London: Ellis Horwood, 1980.

WONG, H. N. C., SONDHEIMER, F., 5,12-Didehydronaphthacene, a derivative of 1,4-didehydronaphthalene. *Tetrahedron Letters*, (1980), 217–20. 5,6-Didehydro-10-methylbenzocyclooctene. *Tetrahedron Letters*, (1980), 983–6.

5,6-didehydro-7-bromodibenzo[*a,c*]cyclooctene and 5,6-didehydro-8-*tert*-butoxydibenzo[*a,c*]cyclooctene as reactive intermediates. A convenient synthesis of dibenzo[*a,c*]cyclooctene. *J. org. Chem.*, 45 (1980), 2438–41.

## COMPUTER SCIENCE

BENNETT, C. J., FROST, D., Network Independent File Transfer, University College London. *Proc. Networks 80 (London),* (1980) 509–26.

DAVIES, G., EASTEAL, C. D., Computer Management Studies for Developing Countries. *Proc. Eleventh SIGCSE Technical Symposium on Computer Science Education, ACM SIGCSE Bulletin, Kansas City,* 12, 1 (1980), 191.

HIGGINSON, P, L., Triple-X and the Transport Service. *Proc. Networkshop 5, University of Kent,* (19-21 September 1979), 59–63.

(Editor). Character Terminal Protocols on PSS. *Study Group 3, Post Office PSS User Forum,* (1979).

HINCHLEY, A. J., Internetwork Gateways to Support Transport Service. *Proc. Networkshop 5, University of Kent,* 19-21 September 1979. 127–34.

(with Grossman, G. R., Sunshine, C. A.), Issues in International Public Data Networking. *Computer Networks, 3,* 4, (1979), 259.

KIRSTEIN, P. T., (with others), Satnet Applications Activities. *Proc. National Telecommunications Conference, Washington,* (1979) 45.5. 1–7.

TREADWELL, S. W., (with others), Experimental Results on the Packet Satellite Network. *Proc. National Telecommunications Conference, Washington,* (1979) 45.1. 1–12.

WALLEY, D., FEARN, T., Trapezium Rules, O.K., *Journal of RSS Series C (Applied Statistics),* 28, 3 (1979), 296–7.

WALLEY, D., (with Galbraith, R. F.), Ergodic Properties of a Two-dimensional Binary Process. *Journal of Applied Probability, 17,* (1980), 124–33.

WASHBROOK, J., STONE, M., (with Mabbett, A.), Cross-validatory Selection in Differential Diagnosis. *Applied Statistics,* 29, 2, (1980), 198–204.

WILBUR, S. R., Low Level Protocols for the Cambridge Ring. *Proc. Networks 80, London,* (1980), 265–76.

Low Level Protocols for the Cambridge Ring. *Proc. Networkshop 5, University of Kent,* 19-21 September 1979, 116–26.

## GEOLOGY

BISHOP, P., JONES, E. J. W., Patterns of glacial and post-glacial sedimentation in the Minches, North-west Scotland. *The North-West European Shelf Seas, 1, Geology and Sedimentology,* ed. F. T. Banner, M. B. Collins and K. S. Massie. Amsterdam: Elsevier, 1979, 89–194.

CURRY, D., (with Rampal, J.), Shell microstructure in fossil thecosome pteropods. *Malacologia,* 18 (1979), 23–5.

DUNCAN, A. M., PRESTON, R. M. F., Chemical variation of clinopyroxene phenocrysts from the trachybasaltic lavas of Mount Etna, Sicily. *Min. Mag,* 43 (1980), 765–70.

GREEN, P. F., Tracking down the past. *New Scientist,* 84 (1980), 624–6.

(with Hashemi-Nezhad, S. R., Durrani, S. A.), Effect of etchant normality on the response of CA80–15 cellulose nitrate to heavy ions. *Proc. 10th Int. Conf. Solid State Nuclear Track Detectors,* Lyons, (1979), 245–50.

(with Bull, R. K., Durrani, S. A.), Etch rates of heavy ion tracks in minerals. *Ibid.,* 1003–8.

GREEN, P. F., MILLEDGE, H. JUDITH, MENDELSSOHN, MONICA J., NAVE, E., WOODS, P., Fission track studies in diamond and kimberlite. *Ibid.,* 973–8.

JONES, E. J. W., *The evolution of passive continental margins in the light of recent deep drilling results,* ed. Sir Peter Kent, A. S. Laughton, D. G. Roberts, E. J. W. Jones. London: The Royal Society, 1980. 208 pp.

On the structure of the Hebridean continental margin. *Nature, Lond.,* 276 (1978), 420–1.

JONES, E. J. W., GODDARD, D. A., Deep-sea phosphorite of Tertiary age from Annan Seamount, Eastern Equatorial Atlantic. *Deep-Sea Research,* 26 (1979), 1363–79.

LORD, A. R., Interpretation of the Lateglacial Marine Environment of NW Europe by means of Foraminiferida. *Studies in the Lateglacial of North-West Europe,* ed. J. J. Lowe, J. M. Gray, J. E. Robinson. Oxford: Pergamon Press, 1980, 103–14.

An investigation of the micropalaeontology of superficial sediments from the continental shelf of southern Africa. *Joint Geological Survey/University of Cape Town Marine Geoscience Unit, Technical Report 11,* (1979), 99–106.

Weichselian (Late Quaternary) ostracods from the Sandnes Clay, Norway. *Geol. Mag.,* 117 (1980), 227–42.

(with Dingle, R. V., Hendey, Q. B.), New sections in the Varswater Formation (Neogene) of Langebaan Road, south-western Cape, South Africa. *Annals of the South African Museum,* 79 (1979), 81–92.

(with Farinacci, A., Pallini, G., Schiavinotto, F.), The depositional environment of the Domerian-Toarcian sequence of Strettura (Umbria). *Geologica Romana,* 17 (1979), 303–23.

MASON, R., (with Boyle, A. P., Griffiths, A. J.), Stratigraphical inversion in the Sulitjelma area, Central Scandinavian Caledonides. *Geol. Mag.,* 116 (1979), 393–402.

MENDELSSOHN, MONICA J., MILLEDGE, H. JUDITH, NAVE, E., WOODS, P. A. (with Vance, E. R.), Internal radioactive haloes in diamond. *Diamond Research,* (1979), 31–6.

MILLEDGE, H. JUDITH, (with Tsai, H. M., Meyer, H. O. A., Moreau, J.), Mineral inclusions in diamond; Premier, Jagersfontein and Finsch Kimberlite, and Williamson Mine, Tanzania. *Proc. 2nd Int. Kimberlite Conf.,* ed. F. R. Boyd and H. O. A. Meyer. American Geophysical Union. 1 (1979), 16–26.

ROBINSON, J. E., The Marine Ostracod Record from the Lateglacial Period in Britain and NW Europe: A Review, 115–22. *Studies in the lateglacial of North-West Europe,* ed. J. J. Lowe, J. M. Gray, J. E. Robinson, Pergamon Press, 1980. 205 pp.

To Geology by way of Kensal Green: Geologists' Association Excursion Report for July 1979. *Proc. Geol. Ass.,* 91 (1980), 235–6.

A Geology of University College. *The Bulletin,* 4 (1980), 1–3.

Graveyard Geology. *Open Earth,* 8 (May 1980).

The ostracod fauna of the interglacial deposits of Sugworth, Oxfordshire. *Phil. Trans. Roy. Soc. Lond., B.,* 289 (1980), 99–106.

Geology in Kensal Green. *Excursion of the Victorian Society,* May 1980. 5 pp.

Greenough Observed. *Geol. Soc. Lond. Newsletter,* 8 (1979), 5–6.

Mantell in West Norwood. *Geol. Soc. Lond. Newsletter,* 9 (1980), 5–6.

## HISTORY AND PHILOSOPHY OF SCIENCE

MAXWELL, N., Science, Reason, Knowledge and Wisdom: A Critique of Specialism. *Inquiry,* 23 (1980), 19–81.

Induction, Simplicity and Scientific Progress. *Scientia,* 114 (1979), 629–53.

RATTANSI, P. M., The Scientific Background. *The Age of Milton. Backgrounds to Seventeenth-century literature,* ed. C. A. Patrides and Raymond B. Waddington. Manchester University Press, 1980, 197–240.

# MATHEMATICS

ANDERSON, J. M., Müntz-Szász theorems and lacunary entire functions. *Linear spaces and approximation. Internat. Ser. Numer. Math.,* 40. Basel: Birkhäuser, 1978, 491–501.

AUSTIN, E. J., Ionization of model atoms by intense electromagnetic fields. *J. Phys.* B, 12 (1979), 4045–55.

Estimation of eigenvalues using Padé approximants. Stark effect for a model system. *Chem. Phys. Lett.,* 66 (1979), 498–9.

BROWN, S. N., STEWARTSON, K., On the secular stability of a regular Rossby neutral mode. *Geophys. Astrophys. Fluid Dynamics,* 14 (1979), 1–18.

BURTON, G. R., Congruent sections of a convex body. *Pacific J. Math.,* 81 (1979), 303–16.

The measure of the *s*-skeleton of a convex body. *Mathematika,* 26 (1979), 290–301.

Skeleta and sections of convex bodies. *Mathematika,* 27 (1980), 97–103.

(with Purdy, G. B.), The directions determined by *n* points in the plane. *J. London Math. Soc.* (2), 20 (1979), 109–14.

DAVIS, A. M. J., Some further results on separation in Stokes flows. *Quart. J. Mech. Appl. Math.,* 32 (1979), 383–6.

Note on a two-phase asymmetric Stokes flow. *Chem. Eng. Commun.,* 4 (1980). 89–93.

(with Ranger, K. B.), Steady pressure driven two-phase stratified laminar flow through a pipe. *Can. J. Chem. Eng.,* 57 (1979), 688–91.

DAVIS, A. M. J., O'NEILL, M. E., The slow rotation of a sphere submerged in a fluid with a surfactant surface layer. *Int. J. Multiphase Flow,* 5 (1979), 413–25.

HAIGHT, J., Covering systems of congruences, a negative result. *Mathematika,* 26 (1979), 53–61.

HIDE, R., How to locate the electrically-conducting fluid core of a planet from external magnetic observations. *Nature,* 271 (1978), 640–1.

On the magnetic flux linkage of an electrically-conducting fluid. *Geophys. Astrophys. Fluid Dyn.,* 12 (1979), 171–6.

Dynamo theorems. *Geophys. Astrophys. Fluid Dyn.,* 14 (1979), 183–6.

(with Gill, A. E., Clever, R. M., Smith, J. M., Jonas, P. R.), The vortex created by mass transfer between layers of rotating fluids. *Geophys. Astrophys. Fluid Dyn.,* 12 (1979), 195–220.

(with Mason, P. J.), On the transition between axisymmetric and non-axisymmetric flow in a rotating liquid annulus subject to a horizontal temperature gradient: hysteresis effects at moderate Taylor number and baroclinic waves beyond the Eady cut-off at high Taylor number. *Geophys. Astrophys. Fluid Dyn.,* 10 (1978), 121–56.

(with Roberts, P. H.), How strong is the magnetic field in the Earth's liquid core? *Phys. Earth and Planet. Int.,* 20 (1979), 124–6.

HIDE, R., HOCKING, L. M., On detached shear layers and western boundary currents in a rotating homogeneous liquid. *Geophys. Astrophys. Fluid Dyn.,* 14 (1979), 19–43.

JAYNE, J. E., ROGERS, C. A., Borel isomorphisms at the first level. *Mathematika,* 26 (1979), 125–79.

First level Borel isomorphisms. *Soviet Math. Dokl.,* 20 (1979), 890–3.

JOHNSON, F. E. A., On groups which act freely on vector bundles over spheres. *Proc. Amer. Math. Soc.,* 75 (1979), 318–20.

On the realisability of poly-surface groups. *J. Pure Applied Algebra,* 15 (1979), 235–41.

LARMAN, D. G., Recent results in convexity. *Proc. Intern. Congress Math., Helzinki,* ed. O. Lehto, Helzinki: Acad. Sci. Fennica, 1980, 430–4.

The d-2 skeletons of polytopal approximations to a convex body in $E^d$. *Mathematika,* 27 (1980), 122–33.

(with Klee, V. L.), Use of Floyd's algorithm to find shortest restricted paths. *Ann. Discrete Math.,* 4 (1979), 237–50.

(with Phelps, R. R.), Gateaux differentiability of convex functions on Banach spaces. *J. London Math. Soc.* (2), 20 (1979), 115–27.

MCMULLEN, P., Transforms, diagrams and representations. *Contributions to Geometry.* J. Tölke and J. M. Wills: Basel, Birkhäuser, 1979, 92–130.

Convex bodies which tile space. *Mathematika,* 27 (1980), 113–21.

(with Gardner, R. J.), On Hammer's X-ray problem. *J. London Math. Soc.* (2), 21 (1980), 171–5.

MASLOWE, S. A., (with Redekopp, L. G.), Solitary waves in stratified shear flows. *Geophys. Astrophys. Fluid Dyn.,* 13 (1979), 185–96.

MICHAEL, D. H., (with Majumdar, S. R.), The instability of plane pendant drops. *J. Colloid Interface Sci.,* 73 (1980), 186–92.

(with Charlesworth, F. D. W., Collins, R., Dover, W. D., Taylor, K. A.), A. C. field measurement: theory and practice. *The measurement of crack length and shape during fracture and fatigue,* ed. C. J. Beevers. Cradley Heath: Engineering Materials Advisory Services Ltd., 1980, 222–60.

O'NEILL, M. E., Asymmetric Stokes flows generated by the motion of a closed torus. *ZAMP,* 30 (1979), 967–83.

(with Bungay, P. M.), The pressure drop along a tube due to an axisymmetric constriction. *J. Colloid Interface Sci.,* 71 (1979), 216–36.

(with Dorrepaal, J. M.), The existence of free eddies in a streaming Stokes flow. *Quart. J. Mech. Appl. Math.,* 32 (1979), 95–107.

(with Ranger, K. B.), On the rotation of a rotelet or sphere in the presence of an interface. *Internat. J. Multiphase Flow,* 5 (1979), 143–8.

POWER, E. A., A review of canonical transformations as they affect multiphoton processes. *Multiphoton Processes,* ed. J. H. Eberly and P. Lambropoulos. New York: Wiley, 1979, 11–46.

(with Mizushima, M.), Anomaly in dispertion intermolecular potential produced by intense radiation field. *Chem. Phys. Lett.,* 70 (1980), 518–25.

(with Thirunamachandran, T.), A canonical transformation in neoclassical radiation theory. *Foundations of Radiation Theory and Quantum Electrodynamics,* ed. A. O. Barut. New York: Plenum Press, 1980, 65–81.

(with Walls, D. F.), The weak atom-atom interaction potential from the master equation for radiation coupled to the atoms, *Chem. Phys. Lett.,* 67 (1979), 467–70.

STEWARTSON, K., A boundary-layer collision in a curved duct. *Quart. J. Mech. Appl. Math.,* 33 (1980), 59–75.

High Reynolds number flows. *IUTAM Symposium on approximation methods for Navier-Stokes problems,* Lecture Notes in Mathematics, 771, Paderborn. New York: Springer, 1979, 505–18.

(with Cebeci, T.), On the stability and transition in three-dimensional flows. *AIAA J.,* 18 (1980), 398–405.

(with Cebeci, T., Khattab, A. A.), Prediction of three-dimensional laminar and turbulent boundary layers on bodies of revolution at high angles of attack. *Proc. International Symposium on Turbulent Shear Flows,* ed. L. S. Bradbury et al. London: 1979, 152.

(with Cebeci, T., Khattab, A. K.), On nose separation. *J. Fluid Mech.,* 97 (1980), 435–54.

(with Weinstein, M.), Marginal convection in a large rigid box. *Phys. Fluids,* 22 (1979), 1421–7.

STEWARTSON, K., WILLIAMS, P. G., (with Cebeci, T., Thiele, F.), On the calculation of symmetric wakes 1. Two-dimensional flows. *Numerical Heat Transfer,* 2 (1979), 35–60.

THOMAS, C. B., Homotopy classification of free actions by finite groups on $S^3$. *Proc. London Math. Soc.* (3), 40 (1980), 284–97.

THOMAS, R. H. K., Pairs of convex bodies. *J. London. Math. Soc.* (2), 19 (1979), 144–6.

TOLAND, J. F., On the stability of rotating heavy chains. *J. Diff. Equns.,* 32 (1979), 15–31.

A duality principle for non-convex optimisation and the calculus of variations. *Arch. Rational Mech. Anal.,* 71 (1979), 41–61.

On subdifferential calculus and duality in nonconvex optimisation. *Bull. Soc. Math. France Mém.,* 60 (1979), 177–83.

(with Stuart, C. A.), A variational method for boundary value problems with discontinuous nonlinearities. *J. London Math. Soc.* (2), 21 (1980), 319–28.

A property of solutions of differential equations with discontinuous nonlinearities. *J. London Math. Soc.* (2), 21 (1980), 329–35.

WATSON, G. L., Determination of a quadratic form by its values at integer points. *Mathematika,* 26 (1979), 72–5.

Existence of an indecomposable positive quadratic form in a given genus of rank at least 14. *Acta Arith.,* 35 (1979), 55–100.

## PHYSICS AND ASTRONOMY

AITKEN, D. K., ROCHE, P. F., SPENSER, P. M., JONES, B., Infrared spatial and spectral studies of an ionization front region in the Orion nebula. *Astron. Astrophys.,* 76 (1979), 60–4.

8–13 micron spectrophotometry of planetary nebulae. *Ap.J.,* 233, (1979), 925–34.

ALVEAR, C., Rescattering effects in antiproton-deuteron annihilation at intermediate energies *Il Nuovo Cimento,* 53A (1979), 191–210.

ARNOLD, S. J., BOKSENBERG, A., (with Sargent, W. L. W.), Measurement of the diameter of Pluto by speckle interferometry *Ap.J.,* 234, (1979), L159–63.

BAKER, N. J., BARTLEY, J. H., BULLOCK, F. W., DAVIES, D. H., JONES, T. W., A measurement of the ratio of the total charged current interaction cross-sections of high energy neutrinos on neutrons and protons. *Proc. Neutrino '79, Bergen,* 2 (1979), 279–85.

BARTLEY, J. H., BURHOP, E. H. S., DAVIS, D. H., GODFREY, L., TOVEE, D. N., (with others), First direct observation of the decay of neutral charmed particles produced by neutrinos in emulsion. *Phys. Lett.,* 87B (1979), 287–91.

On the lifetime of charmed particles. *Neutrino '79 Bergen,* 2 (1979), 3–13.

BELL-BURNELL, S. J., (with others), High energy x-ray observations of Sco-like sources with Ariel V. *Mon. Not. R. Astr. Soc.,* 189 (1979), 563–70.

BELL-BURNELL, S. J., BIBBO, G., Observations of globular clusters with Ariel V 2–20 keV x-ray spectrometer. *Bull. Am. Astr. Soc. 11,* (1979), 787.

BLISSETT, R. J., (with Kahn, S. M.), The x-ray spectra of clusters of galaxies and their relationship to other cluster properties. *Mon. Not. R. Astr. Soc.,* 189 (1979), 329–61.

BOKSENBERG, A., (with others), The nebulosity associated with 3C 120, *Ap. J.,* 236 (1980), 388–405.

Two optically selected QSOs with very broad-lined absorption systems. *Mon. Not. R. Astr. Soc.,* 189, (1979), 175–82.

Observations of the NGC 4151 with IUE *Proc. 2nd European IUE Conference, Tübingen, Germany March 1980,* ESA SP–157 (April 1980), 279–87.
(with Goss, W. M., Danziger, I. J., Fosbury, R. A. E.), Rotation of the large lenticular galaxy NGC 612. *Mon. Not. R. Astr. Soc.,* 190 (1980), 23–6.

BOKSENBERG, A., GONDHALEKAR, P. M., PETTINI, M., SNIJDERS, M. A. J., WILSON, R., (with others), Observations of the UV spectrum of the variable Seyfert Galaxy NGC 4151. *Symp. The First Year of IUE,* ed. A. J. Willis. Univ. Coll. Lond., (1979), 126.
Ultraviolet observations of the quasar 3C 273 and detection of a hot gaseous component in the galactic halo. *Symp. The First Year of IUE,* ed. A. J. Willis. Univ. Coll. Lond.

BOKSENBERG, A., TYTLER, D., (with Sargent, W. L. W., Young, P. J.), The distribution of Lyman-alpha absorption lines in the spectra of six QSOs: evidence for an intergalactic origin. *Ap. J. (Supplement),* 42 (1980), 41–81.

BRANDUARDI, G., MASON, K. O., (with Lamb, D. Q., Kylafis, N. D.), Evidence for the degenerate dwarf nature of Cygnus X-2½. *Ap. J.,* 235 (1980), 153–7.

BRIGGS, S. A., BOKSENBERG, A., CARSWELL, R. F., (with Sargent, W. L. W.), Spectrophotometry of Markarian 3. *Mon. Not. R. Astr. Soc.,* 191 (1980), 665–73.

BULLOCK, F. W., Purely leptonic neutrino interactions. *Proc. Neutrino 79 Bergen,* 1 (1979), 398–428.

BULLOCK, F. W., HENDERSON, R. C. W., JONES, T. W., RAMZAN, F., (with others), Charged current elastic antineutrino interactions in propane. *Nuc. Phys. B.,* 152 (1979), 365–75.

BULLOCK, F. W., JONES, T. W., (with others), Comparison of single $\Pi^0$ production by $\nu$ and $\bar{\nu}$ neutral currents. *Phys. Lett. B.,* 82B (1979), 461–3.

BULLOCK, F. W., JONES, T. W., RATOFF, P. N., (with others), An upper limit to the cross-section for the reaction $\bar{\nu}_\mu \; e^- \rightarrow \bar{\nu}_\mu \; e^-$ at SPS energies. *Phys. Lett. B.,* 84B (1979), 354–6.

CASTILLEJO, L., (with Jackson, A. D., Jennings, B. K., Smith, R. A.), Optimal and nearly optimal distribution functions for *4*He. *Phys. Rev.,* B20, (1979), 3631–40.

CHARLTON, M., GRIFFITH, T. C., HEYLAND, G. R., TWOMEY, T. R., Total scattering cross-sections for low energy electrons in helium and argon. *J. Phys. B. Atom. Molec. Phys.,* 13 (1980), L239–44.

CHARLTON, M., GRIFFITH, T. C., HEYLAND, G. R., LINES, K. S., Cross-sections for positronium formation in gases. *J. Phys. B. Atom. Molec. Phys.,* 12 (1979), L633–9.

CAUSTON, L., DAVIS, D. G., DUFF, B. G., GUETTLER, K., HEYMANN, F. F., IMRIE, D. C., KOOIJMAN, S., LOWNDES, R., LUSH, G. J., (with others), Large-angle elastic scattering of charmed pions on protons at 20 and 30 GeV/c incident momenta. *Phys. Lett.,* 93B, (1980), 199–202.

CREES, M. A., A Program for amending files of card images, *Comput. Phys. Commun.,* 19 (1980), 139–57.

CREES, M. A., ASYPCK, A program for calculating asymptotic solutions of the coupled equation of electron collision theory, *Comput. Phys. Commun.,* 19 (1980), 103–37.

CRUISE, A. M., CULHANE, J. L., OSBORNE, J., COLE, R., ZARNECKI, J., (with others), Soft x-ray observations of Cygnus X2 from Ariel VI, *Bull. Am. Astr. Soc.,* 11 Pt.II (1979).

CULHANE, J. L., Hot gas in clusters of galaxies, *Phil. Trans. R. Soc. Lond. A.,* 296 (1980), 385–97.

CULHANE, J. L., (with others), The soft x-ray polychromator for the Solar Maximum Mission, *Sol. Phys.,* 65 (1980), 53–71.

CULHANE, J. L., BERTHELSDORF, R., IVES, J. C., SANFORD, P. W., (with others), Performance of a flight model gas scintillation counter spectrometer for x-ray astronomy, *IEEE Trans. Nuc. Sci.,* NS26 (1979), 486–9.

CULHANE, J. L., BLISSETT, R. J., MASON, K. O., Ariel V observations of a 4.8 hour periodicity in the 'High State' x-ray spectrum of Cygnus X-3, *Mon. Not. R. Astr. Soc.*, (1980).

CULHANE, J. L., HAYES, M. J. C., BELL-BURNELL, S. J., Ariel V x-ray observations of two type 1 Seyfert galaxies, *Mon. Not. R. Astr. Soc.*, 192 (1980).

CULHANE, J. L., BERTHELSDORF, R. F., Cluster iron lines and the x-ray spectrum of SCO627–544, *Mon. Not. R. Astr. Soc.*, 187 (1979), 17–21.

DARIUS, J., GIDDINGS, J. R., WILSON, R., Discovery of mass loss from hot subdwarfs, *Symp. 'The First Year of IUE'*, ed. A. J. Willis, Univ. Coll. Lond. (1979), 363.

DORLING, E. B., Report for the Period 1978 Oct. 1–1979 Sept. 30. *Q. Jl. R. Astr. Soc.*, (1979).

DUFF, B. G., Proceedings of the school for young high energy physicists, *S.R.C. Rutherford Laboratory (RL.79.006)*, ed. B. G. Duff, (1979).

DUFF, M. J. B., Parallel processors for digital image processing, *Advances in Digital Image Processing*, ed. P. Stucki, Zurich: Plenum Press 1979, 265–76.

FURNISS, I., JENNINGS, R. E., KING, K. J., TOWLSON, W. A., VENIS, T. E., (with Anderegg, M., Moorwood, A. F. M., Salinari, P.), Infrared spectroscopy with a balloon borne Michelson interferometer I. Instrumentation and performance. *Astron, Astrophys.*, 82 (1980), 86–92.

GLENCROSS, W. M., Sheets of material associated with magnetic inhomogeneities in prominences, *Proc. of International Astronomical Union Colloquium*, 44 (1978), 180–3.

Evidence of subphotospheric activity associated with large solar flares, *Mon. Not. R. Astr. Soc.*, 186 (1979), 305–616.

GLENCROSS, W. M., HOWARTH, I., (with Tavenghi, M.), UV observations of x-ray sources in the Magellanic clouds. *Symp. 'The First Year of IUE'*, ed. A. J. Willis, Univ. Coll. Lond. 1979, 343.

GLENCROSS, W. M., HOWARTH, I. O., SANFORD, P. W., WILLIS, A. J., WILSON, R., IUE observations of the Be stars HD 102567 (401145–61), XPer and $\gamma$ Cas, *Astron. Astrophys.*, 85 (1980), 119–27.

GOETCHERIAN, V., From binary to grey tone image processing using fuzzy logic concepts. *Patt. Recog.*, 12 (1980), 7–15.

GONDHALEKAR, P. M., WILSON, R., A comparison of the UV spectra of MK205 and 3C 273, *Symp. The First Year of IUE*, ed. A. J. Willis, Univ. Coll. Lond., (1979), 163.

The ultraviolet spectrum of Q1011+25 (Ton 490), *Symp. The First Year of IUE*, ed. A. J. Willis, Univ. Coll. Lond. (1979), 176.

IUE observations of two high redshift ($Z > 3$) QSOs, *Symp. The First Year of IUE*, ed. A. J. Willis, Univ. Coll. Lond. (1979), 182.

(with Penston, M. V.), The ultraviolet spectra of T Tauri objects, *Symp. The First Year of IUE*, ed. A. J. Willis, Univ. Coll. Lond. (1979), 109.

GRIFFITH, T. C., Experimental aspects of positron collisions in gases, *Advances in Atomic and Molecular Physics*, 15, Academic Press Inc. (1979), 135–66.

Positron interactions in gases, *Proc. 5th International Conf. on Positron Annihilation*, (Tokyo, Japan 1979), 517–26.

GRIFFITH, T. C., HEYLAND, G. R., LINES, K. S., TWOMEY, T. R., Inelastic scattering of positrons by helium atoms at intermediate energies, *J. Phys. B. Atom. Molec. Phys.*, 12 (1979), L747–53.

Total cross-sections for the scattering of positrons by helium, neon and argon at intermediate energies, *App. Phys.*, 19 (1979), 431–7.

GROVES, G. V., Seasonal and diurnal variations of middle atmosphere winds, *Phil. Trans. R. Soc. Lond.*, A296 (1980), 19–40.

GUEST, J. E., BUTTERWORTH, P., MURRAY, J., O'DONNELL, W., *Planetary Geology,* David & Charles, 1979, 208 pp.

HASTED, J. B., Ion-atom charge transfer collisions at low energies, *Adv. in Atom & Molec. Phys.,* 15 (1979), 205–33.

HAYES, M. A., Calculation of oscillator strengths and electron impact excitation collision strengths for FE XXIV, *Mon. Not. R. Astr. Soc.,* 189 (1979), 55–8.

A perturbative treatment of exchange in the close-coupling formalism for electron impact excitation of ions. *J. Phys. B: Atom. Molec. Phys.,* 13 (1980), 819–27.

HERON, M. L., DORLING, E. B., Equatorial ionospheric plasma density bubbles observed by ESRO–4, *Planet. Space Sci.,* 27 (1979), 1303–10.

HOWARTH, I. D., WILSON, R., Simultaneous observations of V861 SCO, *Second European IUE Conf.,* (1980), 237–42.

HOWARTH, I. D., WILLIS, A. J., WILSON, R., (with others), IUE observations of the x-ray source HZ Her/Her X–1, *Astrophys. J.,* 237 (1980), 163–9.

(with Tanzi, E. G., Tarengi, M., Treves, A.), Ultraviolet observations of AM Herculis, *Astron. & Astrophys.,* 83 (1980), 270–4.

(with others), IUE Observations of the x-ray source HZ HER. *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond. (1979), 305.

HUMBERSTON, J. W., Theoretical aspects of positron collisions in gases. *Adv. in Atom Molec. Phys.,* 15 (1979), 101–33.

HUNT, G. E., Thermal infrared properties of the Martian atmosphere IV Atmospheric structure during dust storms from Viking IRTM spectral measurements. *J. Geophys. Res.,* 84 (1979), 2865–74.

Some aspects of Martian dust storms observed during the Viking mission. *1980 Yearbook of Astronomy,* ed. Patrick Moore 1979, 166–77.

On the opacity of Martian dust storms derived by Viking IRTM spectral measurements. *J. Geophys. Res.,* 84 (1979), 8301–10.

A pioneer's view of Venus. *Nature,* 278 (1979), 777–8.

1979: The Year of the Planets: Science fact meets science fiction. *Ad Astra,* 2 issue 2 (1980).

Exploration of the solar system; the Earth in perspective *Meeting of Convocation,* University of London, 1980, 23–6.

Io: the electrified satellite, *Nature,* 283 (1980), 815–6.

God of the Heavens, *Radio Times,* (6 March 1980), 19.

The UCL image processing facilities for climatological studies using Meteosat. *Proc. of 2nd Meteosat Data Users Meeting London ESA* (1980), T1–4.

(with others), Observations of the spectrum of Jupiter from 1500 to 2000 Å with the IUE. *Astrophys. J.,* 236 (1980), L39–L42.

On the role of clouds in the general circulation of the atmosphere, *Q. J. Roy. Met. Soc.,* 106 (1980), 213–5.

(with Beebe, R. F., et al), Measurements of wind vectors, eddy momentum transports and energy conversions in Jupiter's atmosphere from Voyager images, *Geophys. Res. Lett.,* 7 (1980), 1–4.

(with Burgess, E.), Saturn-Lord of the Rings, *New Scientist,* 84 (1979), 864–7.

(with Cook, A. F., Duxbury, T. C.), First results of Jovian lightning, *Nature,* 280 (1979), 794.

A lower limit on the top of Jupiter's haze layer. *Nature,* 280 (1979), 780–1.

(with Martin, T. Z., Miner, E.), Thermal infrared properties of the Martian atmosphere I. Global behaviour at 7, 9, 11 and 20μm for Viking IRTM measurements. *J. Geophys. Res.,* 84 (1979), 2830–42.

(with Smith, B. A., et al), The Jupiter system through the eyes of Voyager, I. *Science,* 20r (1979), 951–72.

Zonal velocity and texture in the Jovian atmosphere inferred from Voyager images. *Nature,* 280 (1979), 773–5.

Jovian cloud structure and velocity fields. *Nature,* 280 (1979), 776–8.
The Galilean satellites and Jupiter: Voyager II imaging science results. *Science,* 206 (1979), 927–50.

HUNT, G. E., MITCHELL, E. A., (with Peterfreund, A. R.), The opacity of some local Martian dust storms observed by the Viking IRTM, *Icarus 41,* (1980), 389–99.

HUNT, G. E., MULLER, J.–P., Comments on 'Light and Dark Spots' in the equatorial regions of Jupiter. *Planet and Space Sci.,* 27 (1979), 1127–9.
Voyager observations of small-scale waves in the Equatorial region of the Jovian atmosphere, *Nature,* 280 (1979), 778–80.

HUNT, G. E., PICKERSGILL, A. O., The formation of Martian lee waves generated by a crater. *J. Geophys. Res.,* 84 (1979), 8317–31.

HUNT, G. E., SAUNDERS, R. W., Meteosat observations of diurnal variation of radiation budget parameters, *Nature,* 283 (1979), 645–7.

JAMES, M., Feature detection using the general linear model. *Patt. Recog.,* 12 (1980), 137–40.

JOHNSTONE, A. D., The closest cosmic radio source. *Nature,* 283 (1980), 718–9.
The solar wind connection, *Nature,* 282 (1979), 229–30.

KILBURN, C., Stars and Planets. London: Franklin Watts, 1980, 48 pp.

LOPES, R. M. C., GUEST, J. E., WILSON, C. J., Origin of the Olympus Mons Aureola and perimeter scarp. *The Moon and Planets,* 22 (1980), 221–34.

McKENZIE, J., CAL in Physics: Simulations. *Learning Through Computers,* ed. D. A. Tawney, London: Macmillan, 1979, 82–9.

McNALLY, D. (Editor), *Learning Strategies in University Science,* Univ. Coll. Cardiff Press, (1979), 362 pp.
Conclusion: or What do we do now? *Learning Strategies in University Science,* Univ. Coll. Cardiff Press, 1979, 339–62.

McNALLY, D., SETTLE, J. J., The collapse of interstellar gas clouds – V. On the stability of non-uniform collapse. *Mon. Not. R. Astr. Soc.,* 192 (1980).

McNALLY, D., BARR, P., The collapse of interstellar gas clouds VI. Formation of molecular hydrogen and its effect on the collapse of spherically symetrical interstellar gas clouds. *Mon. Not. R. Astr. Soc.,* 192 (1980).

MASSEY, H. S. W., *Negative Ions* (Russ. trans. of 3rd ed.), MIR Moscow, 1979. 754 pp.
Introduction. *A Perspective of Physics Vol. 3 Selections from 1978 comments on modern physics,* ed. Sir Harrie Massey. London: Gordon & Breach, 1979, ix–xxxviii.
Problems and possibilities in the study of electron-molecule collisions. *Electron Molecule Scattering – Wiley Series in Plasma Physics,* ed. Sanborn C. Brown, New York, 1979, 185–9.
Negative Ions. *Adv. in Atom. and Molec. Phys.,* 15 (1979), 1–36.

MATHUR, D., HASTED, J. B., Low-lying resonant states in HCl and HBr. *Chem. Phys. Lett.,* 62 (1979), 86–8.

MATHUR, D., HASTED, J. B., KHAN, S. U., Collision processes of electrons with molecular hydrogen ions. *J. Phys. B.,* 12 (1979), 2043–50.

MATHUR, D., HASTED, J. B., Odd and even numbered hydrogen ion clusters, *Nature,* 280 (1979), 573–4.

MILLER, D. J., An electromagnetic calorimeter for BEBC, *Proc. Neutrino '79* Bergen (1979), 598–601.

MITCHELL, R. J., BELL-BURNELL, S. J., CULHANE, J. L., (with Dickens, R. J.), The x-ray spectra of clusters of galaxies and their relationship to other cluster properties. *Mon. Not. R. Astr. Soc.,* 189 (1979), 329–61.

MOORES, D. L., JAKUBOWICZ, H., Electron impact ionization of positive ions. *Comments in Atomic and Molecular Physics,* 9/2 (1980), 55–70.

MOORES, D. L., (with Golden, L. B., Sampson, D. H.), Ionization from the 3p and 3d sublevels of highly charged ions. *J. Phys. B.,* 13 (1980), 385–95.

MOORES, D. L., The autoionization contribution to the electron impact ionization cross section of $C^+$ and $N^{++}$ at low energies. *J. Phys. B.,* 12 (1979), 4171–8.

MOORES, D. L., EISSNER, W., (with Petrini, D.), Autoionizing states $2s2p^6ns$, np of the $Na^+$ ion. *J. Phys. B.,* 13 (1980), 891–7.

MOORES, D. L., Application of the close coupling method to electron molecule scattering. *Electron-molecule and Photon-molecule Collisions,* ed. T. Rescigno, V. McKoy & B. Sneider, Plenum Pub. Corp., 1979, 3–13.

MURRAY, J. B., ROGERS, J. H., Jupiter: the apparition of 1972. *J. Br. Astron. Assoc.,* 89 (1979), 489–503.

MURRAY, J. B., Oscillating peak model of basin and crater formation, *The Moon and the Planets,* 22 (1980), 269–91.

NEWELL, W. R., SMITH, A. C. H., (with Brewer, D. F. C.), A coaxial cone electrostatic velocity analyser I. Analysis of electron optical properties. *J. Phys. E: Sci. Instrum.,* 13 (1980), 11r–22.

A coaxial cone electrostatic velocity analyser II. Construction and use in high-resolution electron scattering experiments. *J. Phys. E: Sci. Instrum.,* 13 (1980), 123–7.

Elastic differential electron scattering from He,Ne, Ar and Kr for incident energies from 7.5 to 20eV. *Abstracts XI Int. Conf: Physics Electronic and Atomic Collisions, Kyoto,* (1979), 100–1.

NEWELL, W. R., KHAKOO, M., SMITH, A. C. H., High resolution electron scattering from atomic and excited molecular oxygen. *Abstrats XIth Int. Conf: Physics Electronic and Atomic Collisions Kyoto,* (1979), 188–9.

NEWELL, W. R., SMITH, A. C. H., (with Brewer, D. F. C.), Elastic differential electron scattering from the polyatomic molecular $Ch_4C_2H_2$ and $C_2H_4$ *Abstracts XIth Int. Conf. Physics Electronic and Atomic Collisions, Kyoto,* (1979), 308–9.

NEWELL, W. R., KHAKOO, M., SMITH, A. C. H., High resolution inelastic electron scattering from molecular oxygen. *Abstracts XIth Int. Conf. Physics Electronic and Atomic Collisions, Kyoto,* (1979), 378–9.

PARKES, G. E., MASON, K. O., (with Murdin, P. G.), The shell spectrum of the optical counterpart of GX 304–11 (4U1258–61). *Mon. Not. R. Astr. Soc.,* 190 (1980), 537–42.

PARKES, G. E., MASON, P. G., CULHANE, J. L., (with Murdin, P. G.), A special study of Wray 977 the optical counterpart of binary x-ray pulsar 4U1223–62. *Mon. Not. R. Astr. Soc.,* 191 (1980), 547–58.

PARKINSON, J. H., What's wrong with the sun? *New Scientist,* (1980), 201–4.

PATRICK, T. J., CURRY, P. J., Response to short pulses of small permanent-magnet stepping motors driving large inertia. *Proc. Int. Conf. on Stepping Motors & Systems* (1979).

PATRICK, T. J., Aerofoils down to low Reynolds numbers and the performance of remote-piloted gliders. *Proc. Int. Conf. on Remotely Piloted Vehicles.* Univ. of Bristol (1979).

PENN, C. J., SEATON, M. J., STOREY, P. J., SNIJDERS, M. A. J., (with others), Ultraviolet observations of Nova Cygni 1978, *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond. 1979, 63–77.

PHILLIPS, A. P., GONDHALEKAR, P. M., Interstellar carbon monoxide in the direction of the supernova remnant S147. *Mon. Not. R. Astr. Soc.,* 191 (1980), 13P–17P.

POLLARD, G. S. G., SANFORD, P. W. (et al), Simultaneous ultraviolet optical and x-ray observations of the x-ray source Vela X-1 (HD77581), *Astrophysics J.* (1980).

Ultraviolet visible infrared and x-ray observations of Sco X-1, *Astrophys. J.*, 237 (1980), 596.
The 1987 x-ray and optical outburst of Aqu X–1 (4U1908+00). *Astrophys. J.*, 237 (1980), 154.
POLLARD, G. S. C., SANFORD, P. W., PARMAR, A. N., (with Polidan, R. S., Oegerle, W. R.), Simultaneous ultraviolet and x-ray observations of the massive binary V861 SCORPIO (=OAO 1653–40?). *Astrophys. J.*, 233 (1979), L7–11.
REES, D., Mid-latitude winds and electric fields in the lower thermosphere and their relationship with the global Sq current system, *J. Geomag. Geolectr.*, 31 (1979), 267–85.
Rocket measurements of annual mean prevailing diurnal and semi-diurnal winds in the lower thermosphere at mid-latitudes, *J. Geomag. Geoelectr.*, 31, (1979), 253–65.
Global wind determination by interferometric techniques in the troposphere, stratosphere and mesosphere. *Proc. CHARM Workshop,* Ajaccio Nov. 1979, ESA Sp–150 (1980), 193–206.
REES, D., ROUNCE, P. A., (with Best, G. T., Quesada, A. F.), Mid-latitude measurements of the thermospheric neutral wind during the ALADDIN programme, *J. Atmos. Terr. Phys.*, 41 (1979), 1171–8.
(with Henriksen, K., Young, D. T.), The CAMEO high altitude lithium release, *Proc. 7th Ann. Meeting on Upper Atmosphere Studies by Optical Methods* (1979), 72–8.
REES, D., SCOTT, A. F. D., (with Cisneros, J. M., Satrustegui, J. M., Widdel, H., Rose, G.), Relationships between the local dynamical structure of the atmosphere and ionospheric absorption during the West European Winter Anomaly Campaign 1975/76. *J. Atmos. Terr. Phys.*, 41 (1979), 1063–74.
REINDERS, L. F., Gluon exchange in meson spectroscopy, *Z. Physik,* C4 (1980), 95–102.
(with Dalitz, R. H.), High lying baryonic multiplets in the harmonic quark shell model, *Physic & Applications,* 4 (1979), 12–64.
SANFORD, P. W., IVES, J. C. (et al), Ultraviolet and x-ray observations of the BL Lac object Mk 501. *Mon. Not. R. Astr. Soc.*, 189 (1979), 873–81.
SARAPH, H., (with Luke, T.), Ecsimpact, a special version of program impact for CDC machines with ex-core memory. *Comp. Physics Communications,* 18 (1979), 287–96.
SAUNDERS, R. W., Estimating radiation budget parameters for Meteosat, *Proc. 2nd Meteosat data users meeting (ESA) Lond.* (1980) Annex. 1.
SEATON, M. J., Theory of recombination lines, *Radio Recombination Lines,* ed. P. A. Shaver, D. Reidel, (1980), 3–22.
(with Harrington, J. P., Lutz, J. H., Stickland, D. J.), Ultraviolet spectra of planetary nebulae – I: The abundance of carbon in IC 418, *Mon. Not. R. Astr. Soc.*, 191 (1980), 13–22.
(with Harrington, J. P., Lutz, J. H.), The observations of the planetary nebula NGC 7662, *Symp. The first year of IUE,* ed. A. J. Willis, Univ. Coll. Lond. (1979), 199–207.
SHARMA, S., AWAD, G. L., HASTED, J. B., MATHUR, D., Energy-loss spectra of product ions in electron capture. *J. Phys. B.*, 12 (1979), 163–6.
SHUTTLEWORTH, T., SMITH, A. C. H., (with Burgess, D. E., Hender, M. A.), Inelastic scattering of electrons by lithium atoms. *J. Phys. B: Atom. Molec. Phys.*, 12 (1979), 3967–78.
SMITH, L. J., WILLIS, A. J., WILSON, R., IUE observations of interstellar SiIV and CIV lines observed in the spectra of WR stars, *Mon. Not. R. Astr. Soc.*, 191 (1980), 339–49.

(with Nussbaumer, H., Huber, M. C. E.), IUE observations of galactic Wolf-Rayet stars. *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond., 1979, 259–80.

IUE observations of interstellar SiIV and CIV lines and absorption by hot gases in the nebula NGC 6888. *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond. 1979, 18–31.

SNIJDERS, M. A. J., BOKSENBERG, A., HASKELL, J. D. J., (with Fosbury, R. A. E., Penston, M. V.), IUE observations of the Seyfert 1 Galaxies 1 Zw 1 II Zw 136 and Mk 231. *Proc. Second European IUE Conf. Tübingen Germany March 1980,* ESA SP–157 (1980), 279–87.

SOMERVILLE, W. B., Extragalactic Astronomy. *Encyclopedia of Astronomy,* ed. C. A. Ronan, London: Hamlyn, 1979.

SØRENSEN, S. A., Gaseous spiral arms in disk galaxies. *Photometry Kinematics and Dynamics of Galaxies,* ed. D. S. Evans, 1979, 489–92.

STACY, R., Isolation of definite naturality exchanges: the general solution. *Z. Physik C. Particles & Fields,* 4 (1979), 207–10.

STARK, J. P., The x-ray spectra and variability of active galaxies, *X-ray Astronomy (COSPAR),* ed. W. A. Baity and L. E. Peterson, 1979, 341–4.

THOMAS, P. K., Optical and infrared telescopes for the 1990s, *Kitt Peak National Observatory Conf.,* II (1980), 850–9.

WHITTET, D. C. B., Interstellar grains: organic or refractory? *Nature,* 281 (1979), 708.

WHITTET, D. C. B., BLADES, J. C., Anomalous diffuse bands in Canis Majoris RI. *Mon. Not. R. Astr. Soc.,* 190 41P–45P.

Grain growth in interstellar clouds, *Mon. Not. R. Astr. Soc.,* 191 (1980), 309–19.

WHITTET, D. C. B., McNALLY, D., (with Dickman, R.), Interstellar abundances of CO and CN molecules. *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond. 1979, 31–8.

WHITTET, D. C. B., SOMERVILLE, W. B., McNALLY, D., BLADES, J. C., The optical interstellar spectra of the Wolf-Rayet stars HD 192163 and HD 191765. *Mon. Not. R. Astr. Soc.,* 189 (1979), 519–25.

WILKIN, C., On the parity of the positive pion. *Journal of Physics G.,* 6, (1980), L5–7.

Coulomb effects in elastic pion-nucleus scattering, *Revista Brasiliera de Fisica Esp.* (1979), 110–26.

Amplitude analysis in pion-nucleus scattering, *A.I.P. Conf. Proc.,* 54 (1979), 537–49.

Deuteron stripping reactions at intermediate energies, *J. Phys. G.,* 6 (1980), 69–80.

(with Germond, J.–F.), Coulomb corrections to elastic pion-nucleus scattering in the Eikonal model, *Ann. Phys. (N.Y.),* 121, (1979), 285–317.

Coulomb effects in inelastic pion-nucleus scattering, *Journal of Physics G.,* 5 (1979), L127–32.

WILLIS, A. J., Ultraviolet eyes in space, *Stars and Space 80.* The Planetarium, Armargh, N. Ireland, (1980), 49–51.

(with Stickland, D. J.), HD 15570: A star intermediate between Of and WN7? *Mon. Not. R. Astr. Soc.,* 190 (1980), 27P–33P.

WILLIS, A. J., GONDHALEKAR, P. M., WILSON, R., (with Nancy, K., Morgan, D. H., Houzlaux, L.), Interstellar extinction in the large Magellanic cloud, *Nature,* 283, (1980), 725–9.

WILLIS, A. J., WILSON, R. (et al), IUE ultraviolet and complementary visible and x-ray observations of Sco X–1. *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond., (1979), 291–305.

Ultraviolet visible infrared and x-ray observations of Sco X–1. *Astrophysics J.*, 238 (1980).

Observations of AM HER with IUE *Symp: The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond. 1979, 349.

(with Macchetto, F., Beekmans, F., Stickland, D. J., van der Hucht, K. A.), IUE observations of spectral variations in the UV spectrum of $\gamma$ Velorum. *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond. (1979), 394–412.

WILSON, R., The International Ultraviolet Explorer. *Transactions of the International Astronomical Union – Reports on Astronomy,* (1979) appendix 2, commission 44.

The uncertainties of opinion polls. *New Scientist,* 82 (1979), 251.

Results from the International Ultraviolet Explorer. *Space Astronomy & Astrophysics,* (1979), 23.

(with Brown, A., Jordan, C.), Observations of cool stars with IUE. *Symp. The First Year of IUE,* ed. A. J. Willis, Univ. Coll. Lond., 1979, 232.

WOOD, A. M., The CLIP4 Array Processor *J.B.I.S.* 33 (1980) 338–44.

## PSYCHOLOGY

ANWAR, FERIHA, HERMELIN, BEATE, Kinesthetic movement after-effects in children with Down's Syndrome. *J. Ment. Defic. Res.,* 23 (1979) 287–97.

AUDLEY, R. J., Final report of mathematical modelling group. *Mental Workload,* ed. N. Moray. New York: Plenum Publishing Corporation, 1979, 269–85.

CROMER, R. F., Spontaneous spelling by language-disordered children. *Cognitive Processes in Spelling.* ed. U. Frith. London: Academic Press, 1980, 405–21.

Normal language development: recent progress. *Language and Language Disorders in Childhood,* ed. L. A. Hersov, M. Berger & A. R. Nichol. Oxford: Pergamon Press, 1980, 1–21.

DREW, G. C., An experimental study of mental fatigue. *Aircrew Stress in Wartime Operations,* ed. E. J. Dearnaley & P. B. Warr. London: Academic Press, 1980, 125–210.

FONAGY, P., Experimental research in psychoanalysis. *Personality,* ed. F. Fransella. London: Methuen, 1980, 56–72.

FRITH, UTA, Reading by eye and writing by ear. *Processing of Visible Language, Vol. I.,* ed. P. A. Kolers, M. E. Wrolstad & H. Bouma. New York: Plenum Publishing Corporation, 1979, 379–90.

(Editor). *Cognitive Processes in Spelling.* London: Academic Press, 1980, 560 pp.

Unexpected spelling problems. *Cognitive Processes in Spelling, Ibid.,* 495–15.

(with Frith, C. D.), Relationships between reading and spelling. *Orthography, Reading and Dyslexia,* ed. J. F. Kavanagh & R. L. Venezky. Baltimore: University Park Press, 1980, 287–95.

GREEN, D. W., (with Newman, S.), The bilingual brain: a review article, *Polyglot,* 2, 1, (1980), 1–28.

Psycholinguistics: cognitive aspects of human communication. *Cognitive Psychology: New Directions,* ed. G. Claxton. London: Routledge & Kegan Paul, 1980, 236–74.

HARVEY, N. J. W., (with Greer, K.), Action: mechanisms of motor control. *New Directions in Cognitive Psychology,* ed. G. Claxton, Routledge & Kegan Paul, 1980, 65–111.

HENLEY, SUSAN H. A., The selection of modern warriors. *J. Roy. Unit. Services Inst. for Def. Stud.,* (December 1979), 13–14.

Selection of medical students: the psychologist's view. *The Practitioner,* (February 1980), 175–80.

HOWELL, P., Change in phoneme targets with different phonation types. *Tutorials in Motor Behaviour,* ed. G. E. Stelmach & J. Requin. North-Holland Publishing Company, 1980, 635–45.

Vowel-contingent feature detection. *Percep. & Psychophys,* 27 (1980), 37–42.

Pitch as a phonemic cue. *Mem & Cog.,* 8 (1980), 285–96.

KUGLER, BARBARA, (with Henley, Susan H. A.), Laterality effects in the tactile modality in schizophrenia. *Hemisphere Asymmetry of Function in Psychopathology,* ed. J. Gruzelier and P. Flor-Henry, Elsevir/North Holland Biomedical Press, 1979, 475–89.

LONG, J. B., Effect of prior context on two-choice absolute judgements without feedback, *Proc. Attention & Performance VIII,* ed. Nickerson, Hillsdale, New Jersey, USA: Erlbaum Associates, 1980, 159–78.

Documenting human-computer mismatch in interactive systems, *Proc. 9th Int. Symp. Human Factors in Telecommunication,* Red Bank, New Jersey, USA: Bell Laboratories, 1980, 17–24.

New technology in the workplace: a method for identifying underlying variables, *Proc. Int. Symp. Anal. & Health Evaluation of the Workplace,* Portoroz, Yugoslavia, 1980, 1–366.

MALIPHANT, R., Juvenile delinquency, *The School Years,* ed. J. C. Coleman, London: Methuen, 1979, 144–69.

MILLAR, W. S., (with Watson, J. S.), The effect of delayed feedback on infant learning re-examined, *Child. Dev.,* 50 (1979), 747–51.

OAKLEY, D. A., Improved instrumental learning in neodecorticate rats, *Physiol. Behav.,* 24 (1980), 357–66.

(with Plotkin, H. C., Rose, F. D., Morgan, S.), Learning in surgical and functional hemidecorticate rats: a preliminary study of compensation, *Behav. Brain. Res.,* 1 (1980), 93–9.

(with Russell, I. S.), Effect of prior experience on bar-pressing in rats without neocortex, *Behav. Brain. Res.,* 1 (1980), 267–83.

O'CONNOR, N., (with Hermelin, Beate), Intelligence differences and conceptual judgement, *Psychol. Res.,* 41 (1979), 91–100.

PLOTKIN, H. C., Learning, change and evolution: an enquiry into the teleonomy of learning. *Adv. Stud. Behav.,* 10 (1980), 1–41.

RAWLES, R. E., (with Phillips, R. J.), Recognition of upright and inverted faces: a correlational study. *Perception,* 8 (1979), 577–83.

(with Le Voi, M. E.), Backward recognition failure: a case for retrieval success. *Q. J. Exp. Psychol.,* 31 (1979) 609–20.

The testing of mental bias. *Times High. Ed. Suppl.,* 392 (1980), 13.

Other books on statistics. *Psychol. Teach.* 9 (1980), 59–60.

RUSSELL, I. S., (with Mohn, G.), Functional localisation within the corpus callosum and the role of other neural pathways in interocular transfer in the rat, *Exp. Brain. Res.,* 36 (1980), 1–17.

The effect of partial callosotomy and additional section of selected commissures on interocular transfer in the rat, *Neurosci. Let.* Supp. 3, (1980), 301–5.

(with Shibata, M.), A retracting wire knife for cutting fiber bundles and making sheet lesions in the brain tissue, *Physiol. & Behav.,* 23 (1980), 201–5.

SANDLER, J., *Unconscious wishes and human relationships,* UCL: Freud Memorial Inaugural Lectures, 1979, 20 pp.

SNOWLING, MARGARET, The development of grapheme-phoneme correspondence in normal and dyslexic readers. *J. Exper. Child. Psychol.,* 29 (1980), 294–305.

STEINBERG, HANNAH, (with Harrison-Read, P. E.), Antidepressant drugs and individual differences in the exploratory activity of rats: contrasting effects of tertiary and secondary amine compounds. *Psychopharm.,* 69 (1980), 85–91.

WEIR, CATHERINE G., Auditory frequency sensitivity of human newborns: some data with improved accoustic and behavioural controls. *Percept. & Pychophys.* 26 (1979), 287–94.

YEO, C. H., (with Moore, J. W.), Cerebral cortex and inhibitory learning. *Exp. Brain. Res.,* 36 (1980), 25–35.

Cortical factors in inhibitory learning. *Neurosci. Let.* Suppl. 3 (1980), 92–100.

## STATISTICAL SCIENCE

BROOKS, R. J., On the relative efficiency of two paired-data experiments, *J. Roy. Statist. Soc. B,* 42 (1980), 186–91.

GALBRAITH, R. F., (with Walley, D.), Ergodic properties of a two-dimensional binary process. *J. Appl. Prob.,* 17 (1980), 124–33.

ISHAM, V. S., (with Cox, D. R.), *Point processes.* London: Chapman and Hall, 1980. 188 + viii.

SMITH, J. Q., Mixture catastrophies and Bayes decision theory. *Math. Proc. Camb. Phil. Soc.,* 86 (1979), 91–101.

A generalisation of the Bayesian steady forecasting model. *J. Roy. Statist. Soc. B,* 41 (1979), 376–87.

STONE, M., The Clark plot: a semi-historical case study. *J. Pharm. Pharmacol.,* 32 (1980), 81–6.

Comments on model selection criteria of Akaike and Schwarz. *J. Roy. Statist. Soc. B,* 41 (1979), 276–8.

(with Angus, J. A., Black, J. W.), Estimation of $pK_B$ values for histamine, $H_2$–receptor antagonists using an *in vitro* acid secretion assay. *Brit. J. Pharmacol.,* 68 (1979), 413–23.

(with Mabbett, A., Washbrook, J.), Cross-validatory selection of binary variables in differential diagnosis. *Applied Statistics,* 29 (1980), 198–204.

(with Dawid, A. P., Zidek, J. V.), Comments on Jaynes' paper 'Marginalization and Prior Probabilities', Chaper 6. *Studies in Bayesian Econometrics and Statistics: Essays in Honor of Harold Jeffreys,* ed. A. Zellner. North-Holland Publ. Co., 1980.

## ZOOLOGY

BEVAN, S., (with Kullberg, R., Rice, J.), An analysis of cell membrane noise. *Annals of Statistics,* 7 (1979), 237–57.

BEVERLEY, P. C. L., Production and use of monoclonal antibodies in transplantation immunology. *Transplantation and Clinical Immunology XI,* ed. J. L. Touraine, J. Traeger, H. Betuel, J. Brochier, J. M. Dubernard, J. P. Revillard, and R. Triau. Amsterdam: Excerpta Medica, 1980, 87–94.

Immunotherapeutic T cells? *Nature,* 280 (1979), 632.

(with others), Sub-populations of normal and leukaemic human thymocytes: analysis using monoclonal antibodies. *J. Natl. Cancer Inst.,* 65 (1980), 33–42.

FELDMANN, M., (with others), Selective production of human antigen specific helper factor from normal volunteers: Implications for human immune response genes. *Clin. Exp. Immunol.*, 37 (1979), 328–38.
Serological analysis of antigen specific helper factors specific for (T.G.)–A–L and GAT. *Eur. J. Immunol.*, 9 (1979), 501–6.
Human antigen specific helper T-cell factors in B cell responses. *In vitro induction and measurement of antibody synthesis in man*, ed. A. S. Fauci and R. E. Ballieux. New York: Academic Press, 1979, 193–207.
Human and mouse specific T-cell helper factors assayed in vivo and in vitro: Implications for human Ir genes. *Transplant Proc.*, 11 (1979), 382–8.
Transplant Proc. 11 (1979), 683–9.
Genetic control of T-cell macrophage interaction in helper cell induction in vitro. *Regulatory role of macrophages Immunity*, ed. A. S. Rosenthal and E. R. Unanue, 1979.
Human T-cell responses in vitro: Cell interactions and factors. *Ann. New York Acad. Sci.*, 332 (1979), 503–15.
Comparison of antigen specific I region associated cell interaction factors. *Ann. New York Acad. Sci.*, 332 (1979), 591–604.
(with Erb, P., Meier, B.), A soluble immune response gene product. Is genetically related macrophage factor (GRF) a soluble immune response (Ir) gene product? *J. Immunol.*, 127 (1979), 1916–19.
(with Kontiainen, S.), Definition of 'constant' and 'variable' region determinants of antigen specific suppressor factors. *Thymys* 1 (1979), 59–79.
(with Rosenthal, A. S., Erb, P.), Macrophage-lymphocyte interactions in immune induction. *Int. Rev. Cytology*, (1979).
FELDMANN, M., CECKA, J. M., REES, A., TORANO, A., WINGER, L., (and others), On the nature of specific factors and the integration of their signals by macrophages, ed. F. Bach, B. Bonavida and E. Vitetta. New York: Academic Press, 1979, 343–60.
FELDMANN, M., (with Erb, P.), Role of GRF in helper cell induction in vitro. *Proc. 2nd Lymphokine Conference*, ed. A. de Weck. F. Kristensen, M. Landy. New York: Academic Press, 1980, 541–4.
FELDMANN, M., TODD, I., (with Erb, P., Kontiainen, S., Woody, J. N.), Comparison of antigen specific I region associated cell interaction factors. *Ann. New York Acad. Sci.*, 332 (1980), 591–604.
FELDMANN, M., (with Kontiainen, S.), Specific T helper and suppressor cells and factors induced in vitro to the hapten NP. *Annal. Immunologie May/June*, 131 (1980), 239–55.
Antigen specific T cell factors. *Molecular and Cellular Biochemistry*, 30 (1980), 177–93.
FISHER, R. C., (with Hooper, M. D., Warren, A.), Proposal for the biological management of the Parque Nacional de la Montana de Coradonga, Asturias, Spain. *U.C.L. Discussion Papers in Conservation No. 25*, London: University College, 1979, 44.
FISHER, R. C., WOOD, J. B., (with Warren, A., Hollis, G. E., Hooper, M. D.), Ichkeul, the problems of a wet park in a dry country. Parks, 4 (3) (1979), 6–10.
FREEMAN, R. B., (with Wertheimer, D.), *Philip Henry Gosse: a bibliography*. Folkestone: Dawson, 1980, xviii + 148.
Starfish and their relatives on the Alderney shore. *Bull. Alderney Soc.*, December (1979), 3–6.
HEAYSMAN, J. E. M., Processes in Cell Culture – Introduction. *Experientia*, 36 (1980), 503.
HORTON, M. A., BEVERLEY, P. C. L., Studies of *in vitro* differentiation of the human cell lines K562 and HL–60. *In vivo and in vitro erythropoiesis: the friend system*, ed. G. B. Rossi. Amsterdam, Elsevier: 1980, 477–85.

KENNEDY, P. G. E., LISAK, R. P., A search for antibodies against glial cells in the serum and cerebrospinal fluid of patients with Multiple Sclerosis and Guillain-Barre syndrome. *J. Neurol. Sci.,* 44 (1979), 125–33.

Astrocytes and oligodendrocytes in dissociated cell culture of adult rat optic nerve. *Neurosci. Lett.,* 16 (1980), 229–33.

KING, C. A., WESTWOOD, R., COOPER, L., PRESTON, T. M., Speed of locomotion of the soil amoeba – *Naegleria gruberi* in media of different ionic compositions with special reference to interactions with the substratum. *Protoplasma,* 99 (1979), 323–34.

KING, C. A., MILLER, R. H., PRESTON, T. M., Analysis of interactions with polycations during amoeboid locomotion of *Naegleria gruberi. J. Protozool.,* 26 (1979), 229A.

KING, C. A., PRESTON, T. M., Studies on the locomotion of *Heteramoeba. J. Protozool.,* 26 (1979), 240A.

KING, C. A., PRESTON, T. M., MILLER, R. H., DONOVAN, P., Cell-substrate interactions during amoeboid locomotion of neutrophil leucocytes. *Expt. Cell. Res.,* 126 (1980), 453–8.

LAKE, P., (with Bromberg, J. S.), Viruses and alloantigens can act as helper determinants for antibody responses to another surface antigen Thy–1. *Cell Biology and Immunology of Leucocyte Function,* ed. M. R. Questel. New York: Academic Press, 1979, 427–35.

LAKE, P., MITCHISON, N. A., (with Clark, E., Nakashima, I.), Alternative routes of entry of cell surface antigens into the immune system. *Natural and Induced Cell Mediated Cytotoxicity,* ed. G. Riethmuller, P. Wernet, and G. Cudkowicz. New York: Academic Press, 1979, 157–63.

LAKE, P., MITCHISON, N. A., BRENAN, M., (and others), Associative recognition in the immune response to alloantigens and xenogenization of alloantigens. *Gann Monograph on Cancer Research, No. 23: Immunological Xenogenization of Tumour Cells,* ed. H. Kobayashi. Baltimore: University Park Press, 1979, 185–92.

LAKE, P., KHORSHIDI, M., SUNSHINE, G., (with Clark, E. A.), Production and characterization of cytotoxic Thy–1 antibody-secreting hybrid cell lines. Detection of T cell subsets. *Eur. J. Immunol.,* 9 (1979), 875–86.

LAKE, P., (with Nakashima, I.), A novel subset of antigenic cells triggers B cell responses to MHC antigens. *Nature,* 279 (1979), 716–8.

LANE, E. B., WHITEAR, M., Skin cells in lamprey epidermis. *Can J. Zool.,* 58 (1980), 450–5.

LISAK, R. P., PRUSS, R. M., KENNEDY, P. G. E., (with others), Antisera to bovine oligodendroglia raised in guinea pigs bind to surface of rat oligodendroglia and Schwann cells. *Neurosci. Lett.,* 17 (1980), 119–24.

MILLER, R. H., Ultrastructural studies on *Naegleria gruberi* amoebae. *J. Protozool.,* 26 (1979), 242A.

MIRSKY, R., WINTER, J., ABNEY, E. R., GAVRILOVIC, J., RAFF, M. C., PRUSS, R. M., Myelin-specific proteins and glycolipids in myelin-forming cells in culture: differences between rat Schwann cells and oligodendrocytes. *J. Cell Biol.,* 84 (1980), 483–94.

MITCHISON, N. A., KNIGHT, J., KNIGHT, A., The kinetics and consequences of latent help to murine alloantigens. *The Molecular Basis of Immune Cell Function,* ed. J. G. Kaplan. Amsterdam: Elsevier/North Holland, 1979, 139–46.

MITCHISON, N. A., Regulation of the response to cell surface antigens. *Current Trends in Tumour Immunology,* ed. S. Ferrone, S. Gorini, R. B. Herberman, and R. A. Reisfeld. New York: Garland STPM Press, 1979, 111–8.

(with Basch, R. S., Grousz, D., Harris, N.), Murine leukaemia virus associated cell surface antigens in rats neonatally infected with Gross virus. *J. Natl. Cancer Inst.,* 63 (1979), 1485–92.

MITCHISON, N. A., SMITH, E. T., HOWES, E. L., CLARK, E. A., Mouse hybrid cell lines produce antibodies to Herpes Simplex cirus type 1. *J. Gen. Virol.*, 44 (1979), 81–2.

MITCHISON, N. A., (with others), MHC matching shows that at least two T cell subsets determine resistance to HSV. *Nature*, 277 (1979), 67–8.

Regulatory circuits initiated by highly specialized antigen presenting cells: the lesson for transplantation. *Behring Institute Mitteilungen* (BIM), 63 (1979), 52–5.

Graft rejection, the major histocompatibility complex and the Langerhans cell. *Clin. Exp. Dermatol.*, 4 (1979), 489–93.

PRESTON, T. M., KING, C. A., Studies on the locomotion of *Acanthamoeba*. *J. Protozool.*, 26 (1979), 239A.

PRESTON, T. M., DAVIES, A. H., KING, C. A., Relationship between speed of locomotion, cell-substrate gap and adhesion in amoeboid locomotion of *Naegleria gruberi*. *J. Protozool.*, 26 (1979), 228A.

PRESTON, T. M., O'DELL, D. S., The cell surface in amoeboid locomotion.

Behaviour of *Naegleria gruberi* on an adhesive lectin substrate. *J. Gen. Microbiol.*, 116 (1980), 515–20.

RAFF, M. C., MIRSKY, R., (with Brockes, J. P., Fields, K. L.), Neural cell markers: the end of the beginning. *Development and Chemical Specificity of Neurons, Progress in Brain Research*, vol. 51, ed. E. Cuenod, G. W. Kreutzberg, and F. E. Bloom, 1979, 17.

RAFF, M. C., MIRSKY, R., (and others), Cell-type specific markers for distinguishing and studying neurons and the major classes of glial cells in culture. *Brain Res.*, 174 (1979), 283–308.

RAFF, M. C., (with Brockes, J. P.), Studies on cultured rat Schwann cells. II. Comparison with a rat Schwann cell line. *In vitro*, 15 (1979), 727–78.

RAFF, M. C., Cell membranes and cell signalling. *Interdisciplinary Science Reviews*, 4 (1979), 140–8.

(and others), Studies on cultured rat Schwann cells. III. Assays for peripherla myelin proteins. *J. Neurocytol.*, 9 (1980), 67–77.

WHITEAR, M., (with Mittal, A. K.), Keratinization of fish skin with special reference to the catfish *Bagarius bagarius*. *Cell Tiss. Res.*, 202 (1979), 213–30.

(with Mittal, A. K., Agarwal, S. K.), Fine structure and histochemistry of the epidermis of the fish *Monopterus cuchia*. *J. Zool. Lond.*, 191 (1980), 107–25.

WOOD, J. B., (with Hollis, T., Warren, A.), Rare wetlands in a National Park. *Geogr. Mag. Lond.*, 52 (1980), 331–5.

## *FACULTY OF ENGINEERING*

## CHEMICAL AND BIOCHEMICAL ENGINEERING

ANG, H.–M., MULLIN, J. W., Crystal growth rate determinations from desupersaturation measurements: nickel ammonium sulphate hexahydrate. *Trans. Instn Chem. Engrs*, 57 (1979), 237–43.

CARLEYSMITH, S. W., DUNNILL, P., LILLY, M. D., Kinetic behavior of immobilized penicillin acylase. *Biotechnol. Bioengng*, 22 (1980), 735–56.

CARLEYSMITH, S. W., EAMES, M. B. L., LILLY, M. D., Staining method for determination of the penetration of immobilized enzyme into a porous support. *Biotechnol. Bioengng*, 22 (1980), 957–67.

CHAPMAN, C. M., NIENOW, A. W., (with Middleton, J. C.), Surface aeration in a small, agitated, and sparged vessel. *Biotechnol. Bioengng*, 22 (1980), 981–93.

CHEETHAM, P. S. J., DUNNILL, P., LILLY, M. D., Extraction of cholesterol oxidase from *Nocardia rhodochrous. Enzyme Microb. Technol.,* 2 (1980), 201–5.

CONTI, R., NIENOW, A. W., Particle abrasion at high solids concentration in stirred vessels – II. *Chem. Engng Sci.,* 35 (1980), 543–7.

DUNNILL, P., The current status of enzyme technology. *Enzymic and Non-enzymic Catalysis,* ed. P. Dunnill, A. Wiseman and N. Blakebrough. Chichester: Ellis Horwood/Wiley, 1980, 28–63.

Biochemical engineering. *Educ. in Sci.,* 85 (1979), 29–30.

(with others), Structure of bovine β lactoglobulin at 6Å resolution. *J. Mol. Biol.,* 131 (1979), 375–97.

GARSIDE, J., The growth of small crystals. *Industrial Crystallization 78,* ed. E. J. de Jong and S. J. Jancić. Amsterdam: North-Holland Publishing Co., 1979, 143–51.

(with Davey, R. J.), Secondary contact nucleation: kinetics, growth and scale-up. An invited review. *Chem. Eng. Commun.,* 4 (1980), 393–424.

(with Rusli, I. T., Larson, M. A.), Initial growth of secondary nuclei produced by contact nucleation. *A. I. Ch. E. Symp. Series* No. 193, 76 (1980), 52–8.

GARSIDE, J., JANCIĆ, S. J., Measurement and scale-up of secondary nucleation kinetics for the potash alum-water system. *A.I.Ch.E. Journal,* 25 (1979), 948–58.

HALLING, P. J., ASENJO, J. A., DUNNILL, P., Nonporous magnetic supports for proteases, cell-lytic enzymes, and ribonuclease: limits of reactant size. *Biotechnol. Bioengng,* 21 (1979), 2359–63.

HALLING, P. J., DUNNILL, P., Reusable enzyme catalysts for particulate and macromolecular reactants and fouling media. *Biotechnol. Bioengng,* 21 (1979), 2365–7.

Hydrolysis of lactose in milk by lactase immobilized to a non-porous magnetic support. *Eur. J. Appl. Microbiol. Biotech.,* 8 (1979), 27–36.

HANISCH, W. H., DUNNILL, P., LILLY, M. D., Optimization of the production of progesterone 11α-hydroxylase by *Rhizopus nigricans. Biotechnol. Bioengng,* 22 (1980), 555–70.

KNIGHT, M. J., ROWE, P. N., On measuring the density of fine particles by pycnometry. *Chem. Engng Sci.,* 35 (1980), 997–1003.

LILLY, M. D., Production of intracellular microbial enzymes. *Appl. Biochem. Bioengng,* 2 (1979), 1–26.

LONG, V. D., Aqueous extraction of black leaf tea: III Experiments with a stirred column. *J. Fd Technol.,* 14 (1979), 449–62.

MACHON, V., NIENOW, A. W., SOLOMON, J., (with Vicek, V.), Some effects of pseudoplasticity on hold-up in aerated, agitated vessels. *Chem. Eng. J.,* 19 (1980), 67–74.

MULLIN, J. W., Crystallization. *Kirk-Othmer Encyclopedia of Chemical Technology, Vol. 7.* New York: Wiley-Interscience, 1979, 243–85.

Crystal growth in pure and impure systems. *Industrial Crystallization 78,* ed. E. J. de Jong and S. J. Jancić. Amsterdam: North-Holland Publishing Co., 1979, 93–103.

translated into Polish in *Przemysl Chemiczny,* 58 (1979), 180–4.

(with Jancić, S. J.), Interpretation of metastable zone widths. *Trans. Instn Chem. Engrs,* 57 (1979), 188–93.

(with Söhnel, O.), Kinetics of precipitation of nickel ammonium sulphate hexahydrate from aqueous solutions. *Kristall und Technik,* 14 (1979), 217–28.

MULLIN, J. W., WHITING, M. J. L., Succinic acid crystal growth rates in aqueous solution. *Ind. Eng. Chem. Fundam.,* 19 (1980), 117–21.

NIENOW, A. W., Aeration of waste water: basic physical factors. *Proc. Symp. on the Profitable Aeration of Waste Water, London, April 1980.* Cranfield: BHRA, 1980, 1–12.

(with Chiba, S., Chiba, T., Kobayashi, H.), Fluidised binary mixtures in which the denser component may be flotsam. *Powder Technol.,* 26 (1980), 1–10.

NIENOW, A. W., LILLY, M. D., Power drawn by multiple impellers in sparged agitated vessels. *Biotechnol. Bioengng,* 21 (1979), 2341–5.

ROWE, P. N., MACGILLIVRAY, H. J., CHEESMAN, D. J., Gas discharge from an orifice into a gas fluidised bed. *Trans. Instn Chem. Engrs,* 57 (1979), 194–9.

THOMAS, C. R., DUNNILL, P., Action of shear on enzymes: studies with catalase and urease. *Biotechnol. Bioengng,* 21 (1979), 2279–302.

THOMAS, C. R., NIENOW, A. W., DUNNILL, P., Action of shear on enzymes: studies with alcohol dehydrogenase. *Biotechnol. Bioengng,* 21 (1979), 2263–78.

WALDRAM, S. P., (with Dudković, M. P.), The dynamic response of a single catalyst pellet. *Chem. Engng. Sci.* 34 (1979), 1361–2.

YATES, J. G., GREGOIRE, J.–Y., Catalytic oxidation of o-xylene in a slugging fluidised bed. *Chem. Engng Sci.,* 35 (1980), 380–5.

## CIVIL AND MUNICIPAL ENGINEERING

ALLSOP, R. E., Scope and limitations of analytical models in optimising traffic control in urban streets. *Proc. Int. Symp. on Traffic Control Systems, Berkeley, California, August 1979, 2D,* 184–201.

Some mathematical aspects of the management and control of traffic in urban road networks. *Bull. Inst. Maths. & Appl.,* 15(11/12) (1979), 283–6.

Some current techniques and developments in the control of traffic by signals. *Proc. Symp. Identification and Control of Road Traffic,* Cracow Techn. Univ., September 1979.

Transport studies and the quality of life. *Envir. Plann. A,* 12 (1980), 339–56.

University College London, Transport Studies Group Progress Report 1979. *Traff. Engng & Control.,* 21(2) (1980), 71–5.

ARTHUR, J. R. F., CHUA, K. S., DUNSTAN, T., RODRIGUEZ DEL, C., Principal stress rotations: A missing parameter (1980) *Journal of Geotechnical Engineering Div. Proc. A.S.C.E.,* Vol. 106, GT4, 419–33.

BANISTER, D. J., Transport Mobility and Deprivation in Inter-Urban Areas: Research Findings and Policy Perspectives. *Geographical Paper No. 71, University of Reading.* London: George Overs (1980).

*Transport Mobility and Deprivation in Inter-Urban Areas.* Farnborough: Saxon House (1980).

Transport mobility in inter-urban areas: a case study approach in South Oxfordshire. *Reg. Studies,* 14(4) (1980), 285–96.

BUCKLEY, D. J., WARDROP, J. G., Some general properties of a traffic network. *Aust. Road Res.,* 10(1) (1980), 21–32.

BRANSTON, D. M., Some factors affecting capacity of signalised intersections. *Traff. Engng. & Control,* 20(8/9) (1979), 390–6.

CROLL, J. G. A., GODOY, L. A., KEMP, K. O., The numerical modelling of cracks in shells. *Proc. 2nd International Conference on Applied Numerical Modelling,* Madrid, 11-15 September (1978). London: Pentech Press, (1979), 365–76.

CROLL, J. G. A., BATISTA, R. C., A design approach for axially compressed unstiffened cylinders. *Stability Problems in Engineering Structures and Components,* Applied Science Publisher Ltd., (1979) Chapter 21, 377–99.

CROLL, J. G. A., ELLINAS, C. P., The basis of a design approach for stiffened plates. *Stability Problems in Engineering Structures and Components,* Applied Science Publisher Ltd., (1979), Chapter 22, 401–22.

CROLL, J. G. A., BATISTA, R. C., A design approach to buckling of cylinders under external pressure. *Thin Walled Structures,* ed. J. Rhodes, and A. C. Walker, Granada (1980).

CROLL, J. G. A., KALELI, F., KEMP, K. O., Meridionally imperfect cooling towers. *J. of the Eng. Mechs. Div.*, A.S.C.E., Oct. (1979), 761–77.

CROLL, J. G. A., (with Billington, D. P.), Cooling towers with non-axisymmetric foundations. Report No. 79–SM–25, Dept. of Civil Eng., Princeton University, Dec. (1979).

GRASS, A. J., KEMP, P. H., Flow visualisation studies of oscillatory flow past smooth and rough circular cylinders. Mechanics of Wave Induced Forces on Cylinders, ed. T. L. Shaw. Pitman, 1979, 406–20.

GRASS, A. J., Vortex induced velocity magnification effects in oscillatory flow past circular cylinders. *Proc. Euromech. Colloquium 119: Vortex shedding from bluff bodies in oscillatory flow.* London: Dept. Aeronautics, Imperial College, July 1979.

GREGORY, J., Physical aspects of particle aggregation and adhesion. *Dental Plaque and Surface Interactions in the Oral Cavity,* ed. S. A. Leach, London: Information Retrieval Ltd., 1980, 7–29.

GRIME, G., The protection afforded by seat belts. *Transport & Road Research Laboratory Special Report* 449 (1979), Crowthorne.

A review of research on the protection afforded to occupants of cars by lap and diagonal seat belts. *Accid. Anal. & Prev.,* 11(4) (1979), 293–306.

HUTCHINSON, T. P., Four applications of a bivariate pareto distribution. *Biom. J.,* 21(6) (1979), 553–63.

An easy method of calculating approximate recurrence risks using a multifactorial model of disease transmission. *Ann. Hum. Genet.,* London 43 (1980), 285–93.

The definition of restraint effectiveness. *Accid. Anal. & Prev.,* 12(2) (1980), 81–93.

IVES, K. J., The basis for the application of multiple layer filters to water treatment. *Zeitschr. für Wasser u. Abwasser Forschung,* 12 (1979) 106–10.

La filtration dans le traitement des eaux residuaires. *Trib. du Cebedeau,* 32 (1979) 187–92.

A deep bed filtration: theory and practice. *Filt. & Separ.,* 17 (1980), 157–66.

(with Al-Dibouni, M.), Orthokinetic flocculation of latex microspheres. *Chem. Eng. Sci.,* 34, (1979), 983–91.

(with Cleasby, J. L., Saatci, A. M.), *Icme Suyu Tasfiyesinde Filtrasyon (Filtration in the purification of drinking water).* Istanbul Technical University, Faculty of Civil Engineering, 1979, 176 pp.

(with Morgeli, B.), New media for effluent filtration. *Wat. Res.,* 13, (1979), 1001–7.

KEMP, P. H., SIMONS, R. R., Turbulent structure in waves and currents. *Hydraulic Res. Stn. Rep.,* 1978. Dept. of Environ. HMSO 20–5.

KHAW, K. H., Empirical studies of journeys to work by modes of transport in Greater London: 1966 and 1971. *Envir. & Plann. A,* 11(4) (1979), 415–22.

PRETTY, R. L., A survey of ferry passengers. *Traff. Engng & Control,* 20(10) (1979), 484–5.

A further treatment of opposed turning movements in traffic signal calculations. *Aust. Road Res. Board Proc.,* 10(4) (1980), 1–7.

Traffic signal calculations in relation to junction layout, capacity and delay. *Traff. Engng & Control,* 21(3) (1980), 110–3.

SRIDHARAN, S., Poisson's effect on buckling of plate assemblies. *Proc. Amer. Soc. Civ. Engrs., J. Struct. Div.,* 105, (1979), 1967–80.

THOMPSON, J. M. T., An evolution game for a prey-predator ecology. *IMA Bulletin,* 15, 7, (1979), 162–7.

WALKER, A. C., SRIDHARAN, S., The buckling of compressed, longitudinally stiffened shells. *Proc. 2nd Int. Conf. on the Behaviour of Offshore Structures,* 2 (1979), 341–56.

WISHART, A. J., GEGORY, J., Filtration of Aqueous suspensions through fibrous media. *Proc. 2nd World Filt. Congress, London* (1979), 415–25.

## ELECTRONIC AND ELECTRICAL ENGINEERING

AMBERSLEY, M. D., BOND, L. J., DOWNIE, A. L., PITT, C. W., SINCLAIR, D. A., SMITH, I. R., The application of ultrasonics in non-destructive testing: a review of some of the research at University College London, *Proc. of the Review of Progress in Quantitative NDE,* La Jolla, California, July 1980.

AMERI, S., ASH, E. A., HTOO, U., MURRAY, D., WICKRAMASINGHE, H. K., Laser detection and imaging techniques for surface examination. *Proc. of ARPA Conference on Review of Progress in Quantitative NDE,* San Diego, California, July 1979,

AMERI, S., ASH, E. A., MURRAY, D., WICKRAMASINGHE, H. K., Detection et Calibrage des Defauts de Surface par les Techniques de la Sonde Laser. *Proc. Colloque Sur Les Methodes Ultrasons En Controle Non Destructif,* Ecole Normale Superieure, Paris, March 1980.

ASH, E. A., (with Dieulesaint, E., Rakouth, H., of Laboratoire d'Acoustoeléctricité de l'Université Piere and Marie Curie), Generation of surface Acoustic waves by means of a c.w. laser. *Electronic Letters,* 16, 12 1980, 470–2.

BALL, P. R., CULSHAW, B., Semiconductor lasers in coherent optical fibre systems. *IEE Jour. of Solid State Electron Devices,* November 1979.

Intermode phase scanning for recovering phase modulated signals on multimode optical fibres. *Electronic Letters,* 16, 7, 27 March 1980, 259–60.

BALL, P. R., CULSHAW, B., KINGSLEY, S. A., Recovery of phase modulated signals in multimode optical fibres. *Proc. IOCC '80, SPIE publication 232, paper 67,* Washington DC, April 1980.

BOND, L. J., ILAN, A., Target Characterisation; an experimental and numerical model study. *Proc. 9th World conference on non-destructive testing,* (1979) Paper 4E–4. Melbourne, Australia. November 19–23. 8 pp.

BOND, L. J., Computer modelling in ultrasonics. *Ultrasonics,* 18 (1980), 43–4.

Modelling waves. *Physics Bulletin,* 31 (1980), 14.

COLE, R. S., MOULSLEY, T. J., The Use of the Atmospheric Acoustic Sounder to Track Methane Gas Plumes. *Atmospheric Environment,* 13, (1979), 1437–41.

CULLEN, A. L., The six-port and the microprocessor in microwave measurements. *Proc. of European Microwave Conf.,* (1979), 74–81.

CULLEN, A. L., JUDAH, S. K., NIKRAVESH, F., Impedance measurement using a 6-port directional coupler. *IEE Proc. 127,* Pt.H, 2, (1980), 92–8.

CULSHAW, B., Minimisation of modal noise in optical fibre connectors. *Electronics Letters,* 15 (1979), 529–31.

Fibre optic sensors. *Proceedings New Frontiers in Fibre Optics,* London: Engineers' Digest.

CULSHAW, B., DAVIES, D. E. N., KINGSLEY, S. A., Multimode optical fibre sensors. *Proceedings of Physics of fibre optics conferences,* Chicago April 1980, American Ceramic Society.

CULSHAW, B., FIDDY, M. A., HALL, T. J., KINGSLEY, S. A., Fibre optic acoustic sensors. *Ultrasonic International,* Grax, Austria, 1979.

CULSHAW, B., HUTCHINGS, M. J., An optical fibre flowmeter. *Electronics Letters,* 15 (1979), 569–71.

CULSHAW, B., KINGSLEY, S. A., Thermal Phase Noise in Optical Fibre Systems, *Electronics Letters,* 16, 3, (1980), 97–9.

DAVIES, D. E. N., Signal Processing for Radar Applications, *Proc. IEE Seminar on Case Studies in Advanced Signal Processing,* Peebles, Scotland, 17-21 Sept. 1979, 145–50.

DAVIES, D. E. N., WARD, C. R., Low Sidelobe Patterns from Thinned Arrays using Multiplicative Processing, *Proc. IEE,* Vol. 127, pt.F. No.1, Feb. 1980, 9–15.

DAVIES, D. E. N., BALL, P. R., CULSHAW, B., HALL, T. J., KINGSLEY, S. A., Fibre Optics and some Coherent Applications. *Digest of Technical Papers,* Conf. on Laser and Electro-optical Systems CLEOS/ICG '80, Feb. 26–28, 1980, San Diego, USA, 66.

DAVIES, J. B., MIRSHEKAR-SYAHKAL, Computation of the Shielded and Coupled Microstrip Parameters in Suspended and Conventional Form. *IEEE Trans., MTT–28,* March 1980, 274–5.

DE OLIVEIRA, A. D., PARRIAUX, O., WILSON, M. G. F., Multimode Couplers for Optical Fibre Systems. *Proc. of Electro-optics/Laser International '80, Brighton,* March 1980.

FORREST, J. R., SEEDS, A. J., Analysis of the Optically Controlled Impatt (OPCAD) Oscillator. *IEE Journ. of Solid State & Electron Devices,* 3 (1979), 161–9.

FORREST, J. R., SCHOENENBERGER, J. G., Totally independent bistatic radar receiver with real-time microprocessor scan correction. *Proc. IEEE International Radar Conference, Washington DC,* (1980), 380–6.

GIBLIN, R. A., BLAKEY, P., CULSHAW, B., Large-signal time-domain modelling of avalanche diodes. *IEEE Trans. ED–26,* No. 11, November 1979, 1718–28.

HARROP, P., MAGARSHACK, J., DESSERT, R., FORREST, J. R., Satellite Communication: Television for Everyone. *IEEE Spectrum,* 17 (1980), 54–6.

MOULSLEY, T. J., COLE, R. S., ASIMAKOPOULOS, D. N., (with Caughey, S. J.), Simultaneous Horizontal and Vertical Acoustic Sounding of the Atmospheric Boundary Layer. *Boundary Layer Meteorology,* 17 (1979), 223–30.

NEUMAN, V., PARRIAUX, O., PITT, C. R., STRIDE, A. A., WALPITA, L. M., Ion-Exchanged Optical Waveguides. *Proc. of Electro-optics and Laser International Conference, Brighton,* March 1980.

PETTS, C. R., WICKRAMASINGHE, H. K., Acoustic Microscopy in Gases. *Electronics Letters,* 3 Jan. 1980, Vol. 16, No. 1, 9.

PITT, C. W., Fabrication Techniques for Dielectric Thin Film Optical Waveguides, *IEE Digest 1980/38 of Integrated Optics Colloquium,* May 1980.

Dielectric Materials for Optical Waveguiding. *IoP Meeting,* London, May 1980.

PITT, C. W., WALPITA, L. M., Lightguiding in Langmuir-Blodgett Films. Thin solid Films, 68, 1 (1980), 101–27.

PITT, C. W., NEUMAN, V., WALPITA, L. M., (with O'Connor, J., Palmer, D. W., Townsend, P. D., Morris, J.), Depth Analysis by R.B.S. of Ion Exchanged Optical Waveguides. *International Conference on Ion-Beam Modification of Materials, Albany, New York,* July 1980.

WICKRAMASINGHE, H. K., BENNETT, S. D., SMITH, I. R., Contrast Analysis in Scanning Acoustic Microscopy. *Proc. IEE Specialist Seminar on Case Studies in Advanced Signal Processing,* Peebles, Scotland, September 1979.

WILSON, M. G. F., BONE, M., Theory of Curved Diffraction Gratings. *Microwaves, Optics and Antennas,* June 1980, 127–32.

WRIGHT, S., DE OLIVEIRA, A. D., WILSON, M. G. F., Optical Waveguide Polariser with Synchronous Absorption. *Elect. Lett.,* 15, 17 (1979), 510–2.

# MECHANICAL ENGINEERING

BELIK, O., BISHOP, R. E. D., BROWN, J. C., PRICE, W. G., A Comparison of Theoretical and Measured Symmetric Responses of a Segmented Model in Regular Waves. *Proc. EUROMECH 122, on Numerical Analysis of the Dynamics of Ship Structures,* (1979), 83–93.

BELIK, O., BISHOP, R. E. D., PRICE, W. G., On the Slamming Response of Ships to Regular Head Waves. *Trans. RINA, Paper W(13), (1979).*

BISHOP, R. E. D., *Vibration,* 2nd Edition, Cambridge Univ. Press, (1979), 140 pp.

(Ed. with Armand, J.–L.), Numerical Analysis of the Dynamics of Ship Structures, *Proc. EUROMECH Colloquium 122, ATMA, Paris,* (1979), 616 pp.

(with Gladwell, G. M. L., Michaelson, S.), *The Matrix Analysis of Vibration,* Cambridge Univ. Press, re-issue, 1979, 416 pp.

(with Johnson, D. C.), *The Mechanics of Vibration,* Cambridge Univ. Press, re-issue, 1979, 604 pp.

BISHOP, R. E. D., PRICE, W. G., *Hydroelasticity of Ships,* Cambridge Univ. Press, 1979, 410 pp.

Some Observations on Linear Hydroelasticity of Ships. *(Opening Lecture), Proc. EUROMECH 122 on Numerical Analysis of the Dynamics of Ship Structures,* (1979), 3–17.

The Structural Dynamics Problems of Naval Architecture. *Acoustics Bulletin,* 4, (1979), 10–1.

BISHOP, R. E. D., PRICE, W. G., TEMAREL, P., Wave-Induced Antisymmetric Response of a Flexible Ship. *Proc. EUROMECH 122, on Numerical Analysis of the Dynamics of Ship Structures,* (1979), 129–45.

A Unified Dynamical Analysis of Antisymmetric Ship Response to Waves. *Trans. RINA, Paper W(15),* (1979).

Hydrodynamic Coefficients of Some Swaying and Rolling Cylinders of Arbitrary Shape. *International Shipbuilding Progress,* 27, (1980), 54–65.

BROWN, D. T., Losses Caused by Friction in Straight Pipes with Systematic Roughness Elements. *Engineering Sciences Data Unit (E.S.D.U.) Vol. 79014, Sept.,* (1979), 1–40.

BROOME, D. R., GODFREY, L. J., LAMBERT, T. H., Hybrid Simulation of an Integrated Ship Control System. *Proc. IMACS Congress 1979 Simulation of Systems, Sorrento,* (1979), 1–10.

BROOME, D. R., KEANE, A. J., MARSHALL, L., The Effect of Variations in Ship Operating Conditions on an Adaptive Autopilot Optimising Function. *Proc. Symp. on Ship Steering Automatic Control, Genova,* (1980).

BROOME, D. R., (with Elias, N. R.), Integrated Control of Ship Roll and Yaw Motions. *Trans. INSTMC,* 1, 3 (1979).

BURCHER, R. K., The Influence of Hull Shape on Transverse Stability. *The Naval Architect,* 3 (1980), 111–28.

CHALMERS, D. W., (with Rogers, D. F., Richardson, D.), Interactive Graphics and the Uniform Beam in Engineering Education. *Proc. 2nd Ann. Conf. on Computing in Civil Engineering, American Society of Civil Engineers,* (1980), 436–57.

CLAYTON, B. R., The Effect of Varying Blade Height on the Performance of Mixed Flow Fans. *Proc. Fluid Mechanics Silver Jubilee Conf., National Engineering Laboratory,* (1979), 32 pp.

CLAYTON, B. R., MASSEY, B. S., Exact Similar Solution for an Axisymmetric Laminar Boundary Layer on a Circular Cone. *AIAA Jl.,* 18 (1980).

CLAYTON, B. R., FILBY, P., Wake Structure Analysis. *Proc. at 2nd British Wind Energy Conf., Cranfield,* (1980), 10 pp.

COLLINS, R., The Effect of Some Unsteady Motions on Gas Flow Patterns Around a Fluidization Bubble. *Proc. Int. Conf. on Fluidization,* ed. J. R. Grace and J. Matsen, (1980), 25–32.

DAVIES, B. L., IHNATOWICZ, E., A Three Degree of Freedom Robotic Manipulator. *Proc. 9th Int. Robotic Symp., Washington D.C.,* (1979).

DOVER, W. D., Introduction to Offshore Structures. *Trans. Tech.,* Chapter 12, (1980).

Fracture Mechanics – Current Status, Future Prospects. *S.E.E.,* (1980).

(with Holdbrook, S. J.), Fatigue Crack Growth in Tubular Welded Connections. *Int. J. Fatigue, Jan. 1980,* (1980), 37–43.

The Stress Intensity Factor for a Deep Surface Crack in a Finite Plate, *Eng. Frac. Mech.,* 12 (1979), 347–64.

DOVER, W. D., TAYLOR, K. A., COLLINS, R., (with Charlesworth, F. D. W., Michael, D. H.), The Measurement of Crack Length and Shape During Fatigue and Fracture, *E.M.A.S.,* (1980).

DUNCAN, P. E., A Scheme for the Interpretation of Data from Instrumented Offshore Platforms. *Journal of Sound and Vibration,* 64 (1979), 497–513.

Model Tests Illuminating the Fluid-Structure Interaction for Large Volume Offshore Structures. *Proc. Joint I. Struct. E./B.R.E. two day seminar on the use of physical models in the design of offshore structures, 15-16 Nov.,* (1979), 1–12.

EATOCK-TAYLOR, R., A Linear Analysis of Interaction Problems in Offshore Platforms. *Proc. Conf. Behaviour of Offshore Structures, BOSS 79, London,* II (1979), 61–86.

*Conference Report: ASCE Convention, Eng. Struct.,* 1 (1979), 274–5.

Accelerated Convergence of Receptance Matrices, *Eng. Struct.,* 2 (1980), 65–7.

EATOCK-TAYLOR, R., DUNCAN, P. E., Fluid Induced Inertia and Damping in Vibrating Offshore Structures. *Appl. Ocean Res.,* 2 (1980), 3–12.

EATOCK-TAYLOR, R., (with Dolla, J.–P.), Hydrodynamic Loads on Vertical Axisymmetric Bodies. *Trans. RINA, Paper W11,* (1979).

INGLIS, R. B., PRICE, W. G., Motions of Ships in Shallow Water. *Trans. RINA, Paper W10,* (1979).

Calculation of the Velocity Potential of a Translating Pulsating Source. *Trans. RINA, Paper W2,* (1980).

Comparison of Calculated Responses for Arbitrary Shaped Bodies Using Two and Three Dimensional Theories. *International Shipbuilding Progress,* 27 (1980), 86–95.

LORD, M., Technical Development of Pedobarograph Facilities. *Biomech. Res. & Dev. Unit, D.H.S.S. Roehampton, Report,* (1979), 238–41.

(with Chodera, J. D.), Pedobarographic Study of Gait (Abstract). *J. Biomed. Eng.,* 2, 2 (1980), 86–7.

Basic Interpretation of Pedobarograms. *Int. Conf. Rehab. Eng., Canadian Rehab. Council for the Disabled, Toronto,* (1980), 274–7.

Pedobarographic Foot Pressure Measurements and their Applications. *Disability,* ed. Kennedi et al, MacMillan Press, (1979), 173–81.

(with Dewar, M., Jarman, P., Kinnear, E.), Biofeedback Aids in Rehabilitation, *Biomech. Res. & Dev. Unit, D.H.S.S. Roehampton, Report,* (1979), 233.

(with Ring, N. D., Brown, A. N. S.), An Investigation into the Control of Involuntary Arm Movements, Future Priorities in Orthotics and Prosthetics, *Abstr. Int. Soc. Prosthetics & Orthotics,* UK, (1980), 57–9.

MARSHALL, L., BROOME, D. R., Manual Coursekeeping in Ships. *Proc. Annual Conference, Ergonomics Research Society, Nottingham,* (1980).

A Cost Function Indicator for Optimal Ship Coursekeeping. *Proc. IFIP/IFAC Symposium ASSOPO '80,* Trondheim: North Holland Pub. Co., (1980), 103–8.

MASSEY, B. S., Mechanica de Fluidos. (Spanish translation of Mechanics of Fluids). *C.E.C.S.A.* (Mexico), (1979), 750 pp.

A Rational Angle on SI, *Chartered Mechanical Engineer,* 26, 11 (1979), 77.

MIKELIS, N. E., PRICE, W. G., Calculation of the Hydrodynamic Coefficients for a Body Manoeuvring in Restricted Waters Using a Three Dimensional Method. *Trans. RINA, Paper W4,* (1980).

Calculations of Acceleration Coefficients and Correction Factors Associated with Ships Manoeuvring in Restricted Waters: Comparison between Theory and Experiments. *Trans. RINA, Paper W5,* (1980).

PARKINSON, A. G., (with Darlow, M. S., Smalley, A. J.), A Theoretical Introduction to the Development of a Unified Approach to Flexible Rotor Balancing, *J. Sound Vibration,* 68 (1980), 489–506.

Demonstration of a Unified Approach to the Balancing of Flexible Rotors. *ASME Int. Gas Turbine Conference,* Paper 80–GT–87 (1980).

PATEL, M. H., On Delta Wings in Oscillatory Gusts. *AIAA Journal,* 18, 5, May (1980), 481–6.

PATEL, M. H., IOANNOU, P. A., A Comparative Performance Study of Paddle and Wedge Type Wave Generators. *Journal of Hydronautics,* 14, 1, Jan (1980), 5–9.

PRICE, W. G., Discussion to Spring Meeting, Paper 8. *Trans. RINA,* 121, (1979), 36.

PRICE, W. G., BISHOP, R. E. D., Probabilistic Theory of Ship Dynamics (Japanese Ed.), Tokyo: Kyoritsu Shuppan Co. Ltd., 1980, 311.

## PHOTOGRAMMETRY AND SURVEYING

ALLAN, A. L., The education of surveyors within the EEC. *Proceedings of International Study Seminar, Education for a new professionalism.* Rome: Consiglio Nazionale Geometri, 1980, 29 pp.

ATKINSON, K. B. (Editor), *Developments in close range photogrammetry–1.* London: Applied Science Publishers Ltd., 1980. xii + 222.

The Predhumeau stereotopometer. *Photogrammetric Record,* 9 (1979), 857–8.

Vivian Thompson (1880–1917): not only an officer of the Royal Engineers. *Ibid.,* 10 (1980), 5–38.

DOWMAN, I. J., Instrumentation for image correlation along epipolar lines with special reference to the CP1 plotter. *Equipment for analytical photogrammetry and remote sensing,* ed. M. Baussart and A. Fontanel. Paris: Editions Technip. 1979, 189–99.

A new system for automatic determination of heights. *Photogrammetric Record,* 10 (1980), 63–72.

The future of photogrammetry in the electronic age. *Chartered Land Surveyor/ Chartered Mineral Surveyor,* 1 (1979), 4–14.

British photogrammetry into the Eighties. *Ricerche di Geodesia Topografia e Fotogrammetria,* 1 (1979), 125–34.

DOWMAN, I. J., SCOTT, P. J., Photogrammetric theory, techniques and problems. *Developments in close range photogrammetry–1,* ed. K. B. Atkinson. London: Applied Science Publishers Ltd., 1980, 15–37.

GRANSHAW, S. I., Industrial photogrammetry. *Photogrammetric Record,* 10 (1980), 95–6.

SCOTT, P. J., GEORGOPOULOS, A., Camera calibration at very close focal settings. *Photogrammetric Record,* 9 (1979), 853–5.

# *FACULTY OF ENVIRONMENTAL STUDIES*

## BARTLETT SCHOOL OF ARCHITECTURE AND PLANNING

BANISTER, D. J., *Transport Mobility and Deprivation in Inter-Urban Areas: Research Findings and Policy Perspectives.* Geographical Paper No. 71, University of Reading. London: George Overs, 1980. 62 pp.

*Transport Mobility and Deprivation in Inter-Urban Areas.* Farnborough: Saxon House, 1980. 200 pp.

Transport Mobility in inter-urban areas: a case study approach in South Oxfordshire. *Regional Studies,* 14 (4) (1980).

CLIFFORD, J., LOWE, P., The countryside in 1980. *Ecos,* 1 (1980), 9–13.

The Caravan Club. *Vole, 3* (March 1980), 35–8.

The Society for the Promotion of Nature Conservation. *Vole, 3* (April 1980), 23–6.

(with Buchanan, S.), The Mass Movement of the Decade, *Vole, 3* (January 1980), 26–8.

EDHOLM, O. G., Nutrition and physical working capacity. *Ergonomics in Tropical Agriculture and Forestry,* ed. J. H. van Loon, F. J. Standt and J. Zanda. Wapenigen, Holland: Centre for Agricultural Publishing and Documentation, 1979, 18–24.

(with de Monchaux, Cecily), Psychological studies in the Antarctic. *Br. Antarct. Surv. Bull.,* 48 (1979), 93–7.

(with Imms, F. J.), Assessment of gait and mobility in the elderly. *Age and Ageing,* 8 (Suppl.) (1979), 261–7.

EDWARDS, M., Planning and the Land Market, *Production of the Built Environment: Proceedings of the Bartlett Summer School 1979.* London: UCL, 1980, 182–9.

EDWARDS, M., IVE, G., (with Gray, F., Paddon, M.) (Editors), *Housing, construction and the state, a third volume of papers presented to the Political Economy of Housing Workshop.* London: CSE, 1980, 68 pp.

EDWARDS, M., LOVATT, D., *Understanding Urban Landmarkets: A Review.* London: SSRC, 1980, pp. iv + 54. (Vol. I of *The Inner City in Context.)*

FORTY, A., Lorenzo of the Underground. *London Journal,* 5 (1) (1979), 113–9.

(with Moss, H.), A housing style for troubled consumers: the success of pseudo-vernacular. *Architectural Review,* CLXVII, 996 (Feb. 1980), 73–8.

GROAK, S. J., The indefinite article. *9H: Bartlett Translations,* 1 (1980) 15–7.

GYFORD, J. E. B., Political parties and central-local relations: a case for research. *Central-Local Government Relations in Great Britain,* ed. G. W. Jones. Farnborough: Saxon House, 1980.

Planning with personalities and politics in mind, *The Planner,* 66 (1980), 12–4.

IVE, G., Fixed capital in the British building industry. *Production of the Built Environment: proceedings of the Bartlett Summer School 1979.* London: UCL, 1980.

Urban and industrial spatial restructuring on Merseyside: the mobility of capital and the 'urban crisis'. *Production of the Built Environment: proceedings of the Bartlett Summer School 1979.* London: UCL, 1980.

LONGMORE, J., MUSGROVE, J., City development and planning as aids to transport system design and energy conservation. *Resources for Electric Vehicles and Their Infrastructure.* Electric Vehicle Development Group Conference. London, 1979, 37–42.

LONGMORE, J., Successful measurement of light in buildings. *Electrical Times,* (Sep. 7, 1979), 7.

LOWE, P., (with Buchanan, S.), The National Trust, *Vole, 3,* (February 1980) 31–3.

(with Buller, H.), The Council for the protection of Rural England, *Vole, 3,* (June 1980).

MERRETT, S. R., *State Housing in Britain.* London: Routledge and Kegan Paul, 1979, 376 pp.

MOSER, C. O. N., Is migration a problem? *Proceedings: Town and Country Planning Association Summer School, 1979.*

MUMTAZ, B., Planning for People. Viewpoint. *Viewpoint.* Lahore, Pakistan, (1979).

Deschooling architectural education. *Proceedings of Seminar '79.* Karachi, Pakistan, (1980).

SMART, A. D. G., Environmental Studies. *The Student Book 1979–80,* ed. K. Boehm, N. Wellings, Macmillan Press Ltd., 1980, 117–8.

SWENARTON, M. C., Should we stop exhibiting design? *London Journal,* VI (1) (1980).

(with Pepper, S.), Les banlieues-jardins des travailleurs de l'armement en Grande Bretagne (1915–1918). *Urbi,* III (1980), lxviii–lxxx.

TABOR, O. P., (with Hare, N.), Co-editor, and Introduction. *Office Performance.* Cambridge: Diploma Publications, 1980, 196 pp.

WATSON, NEWTON F., LOE, D., Tate Gallery extension, London. *International Lighting Review,* 1 (1980), 16–18.

WIBBERLEY, G. P., Maintien d'une population stable dans les zones rurales. *Publications de la CEA,* Fascicule 61 (1979), 38–46.

Tomorrow's rural population – different but dynamic. *World Agriculture,* 28 (3–4), (1979), 3.

(with Reid, I. G.), Policy for rural areas in the European Community. *Select Committee, House of Lords – Minutes of Evidence.* Submission, 168–71.

(with Gilg, A. W.), *Countryside Planning: the first three decades. Regional Studies,* 13, 6 (1979), 563.

(with Tranter, R. T. B.), (Editor), The Future of Upland Britain. Jnl. Agricultural Economics, XXX, 3 (1979), 382–3.

(with Newby, H.), *Green and Pleasant Land? Social Change in Rural England. Jnl. Agricultural Economics,* XXXII (1980), 301.

## *FACULTY OF MEDICAL SCIENCES*

## ANATOMY AND EMBRYOLOGY

BROWN, C., BURNSTOCK, G., (with Banks, B. E. C., Burgess, G. M., Claret, M., Cocks, T., Jenkinson, D. H., Parson, H.), Some peripheral activities of apamin. *Toxicon,* 17 (1979), 4.

BROWN, C., BURNSTOCK, G., (with Banks, B. E. C., Burgess, G. M., Claret, M., Cocks, T., Jenkinson, D. H.), Apamin blocks certain neuro-transmitter-induced increases in potassium permeability. *Nature,* 282 (1979), 415–7.

BANKS, R. W., (with Bessou, P., Joffroy, M., Pagés, B.), Reflex responses of pools of gastrocnemius lateralis GABA motoneurones elicited by ipsilateral sural nerve stimulation in the cat. *J. Physiol.,* 296 (1979), 107 P.

BELLAIRS, R., The mechanism of somite segmentation in the chick embryo. *J. Embryol. exp. Morph.,* 51 (1979), 227–43.

BELLAIRS, R., (with Sanders, E. J., Portch, P. A.), Behavioural properties of chick somitic mesoderm and lateral plate when explanted *in vitro*. *J. Embryol. exp. Morph.*, 56 (1980), 41–58.

BELLAIRS, R., VEINI, M., An experimental analysis of somite segmentation in the chick embryo. *J. Embryol. exp. Morph.*, 55 (1980), 93–108.

BOYDE, A., (with Lester, K. S.), SEM of self-threading pins in dentine. *Operative Dentistry*, 4 (1979), 56–62.

(with Reith, E.), The enamel organ, a control gate for calcium influx into the enamel. *J. dent. Res. Spec. Issue. B*, (1979), 980.

(with Schur, K.), Photoemission electron microscopy of sound enamel. *Caries Res.*, 13 (1979), 91.

BOYDE, A., MACONNACHIE, E., Treatment with lithium salts reduces ethanol dehydration shrinkage of glutaraldehyde fixed tissue. *Histochem.*, 66 (1980), 181–7.

Volume changes during preparation of mouse embryonic tissue for scanning electron microscopy. *Scanning*, 2 (1979), 149–63.

Freon freeze drying for scanning electron microscopy. *Scanning*, 2 (1979), 164–6.

BURNSTOCK, G., Non-adrenergic, non-cholinergic enteric neurones: their roles and interactions with classical nerves. *Hormone Receptors in Digestion and Nutrition*, ed. G. Rosselin, P. Fromageot and S. Bonfils. Amsterdam: Elsevier/North Holland Biomed. Press, 1979, 481–92.

Interactions of cholinergic, adrenergic, purinergic and peptidergic neurons in the gut. *Integrative Functions of the Autonomic Nervous System*, ed. C. Brooks, K. Koizumi and A. Sato. University of Tokyo Press, 1979, 145–58.

Past and current evidence for the purinergic nerve hypothesis. *Physiological and Regulatory Functions of Adenosine and Adenine Nucleotides*, ed. H. P. Baer and G. I. Drummond. New York: Raven Press, 1979, 3–32.

Cholinergic and purinergic regulation of blood vessels. *Handbook of Physiology*, Section 2: *The Cardiovascular System*, Vol. II Vascular Smooth Muscle, ed. D. F. Bohr, A. D. Somlyo, H. W. Sparks and S. R. Geiger. Baltimore: Amer. Physiol. Soc. Waverly Press, 1980, 567–612.

Evidence for purinergic nerves. *Vascular Neuroeffector Mechanisms*, ed. J. A. Bevan, Th. Godfraind, R. A. Maxwell and P. M. Vanhoutte. New York: Raven Press, 1980, 181–2.

Autonomic innervation and transmission. *Br. Med. Bull.*, 35 (1979), 255–62.

Purinergic modulation of cholinergic transmission. *Gen. Pharmac.*, 11 (1980), 15–8.

Non-adrenergic, non-cholinergic nerves in the intestine and their possible involvement in secretion. *Mechanisms of Intestinal Secretion*. KROC Foundation Series, Vol. 12, ed. H. J. Binder. New York: Alan Liss Inc., 1979, 147–74.

Morphological changes produced by drugs acting on the autonomic nervous system. *Pharmac. Ther.*, 5 (1979), 49–53.

The ultrastructure of autonomic cholinergic nerves and junctions. *Prog. Brain. Res.*, 49 (1979), 3–21.

(with Berger, P. J.), The autonomic nervous system. *Biology of the Reptilia*, Vol. 10 Neurology B, ed. C. Gans, R. G. Northcutt and P. Ulinski. London & New York: Academic Press, (1979), 1–57.

(with Chamley, J. H., Campbell, G. R.), The innervation of arteries. *Structure and Function of the Circulation*, Vol. 1, ed. C. J. Schwartz, N. Werthessen and S. Wolf. Plenum Press, (1980), 729–65.

(with De Mey, J., Vanhoutte, P. M.), Modulation of the evoked release of noradrenaline in canine saphenous vein via presynaptic receptors for adenosine but not ATP. *Europ. J. Pharmacol.*, 55 (1979), 401–5.

(with Evans, B. K.), Chronic guanethidine treatment of female rats including effects on the fetus. *J. Reprod. Fert.*, 56 (1979), 715–24.
(with Evans, B. K., Heath, J. W.), Reinnervation following guanethidine-induced sympathectomy of adult rats. *J. Neurocytol.*, 8 (1979), 381–400.
Effects of chronic guanethidine on the sympathetic nervous system of mouse and toad. *Comp. Biochem. Physiol.*, 63C (1979), 81–92.
(with Ferrero, J. D., Cocks, T.), A comparison between ATP and bradykinin as possible mediators of the responses of smooth muscle to non-adrenergic, non-cholinergic nerves. *Europ. J. Pharmacol.*, 63 (1980), 295–302.
(with Hökfelt, T., Gershon, M. D., Iverson, L. L., Kosterlitz, H. W., Szurszewski, J. H.), Non-adrenergic, non-cholinergic autonomic neurotransmission mechanisms. *Neuroscience Res. Prog. Bull. 17*, No. 3, Cambridge (Mass): MIT Press, 1979, 149 pp.
(with Travo, P., Barrett, G.), Differences in proliferation of primary cultures of vascular smooth muscle cells taken from male and female rats. *Blood Vess.*, 17 (1980), 110–6.
BYNUM, W., (Consultant ed.), Charles Darwin's *The Illustrated Origin of Species*, ed. R. Leakey. London: Faber & Faber, New York: Hill & Wang, (1979).
BYNUM, W., Hospital, Disease and Community: the London Fever Hospital, 1801–1850. *Healing and History*, ed. C. Rosenberg, New York: Science History Publications, Folkestone: Dawsons, (1979), 97–115.
BYNUM, W., NUTTON, V., Edwin Clarke at the Wellcome Institute, *Medical History*, (1980), 127–8 pp.
CAMPBELL, G., LIEBERMAN, A. R., Presynaptic dendrites in the olivary pretectal nucleus of the albino rat. *J. Anat.*, 129 (1979), 863–6.
Synaptic relationships and forms of terminal degeneration of retinal afferents to the olivary pretectal nucleus in the rat. *J. Anat.*, 130 (1980), 645–6.
COWEN, T., BURNSTOCK, G., Quantitative analysis of the density and pattern of adrenergic innervation of blood vessels: A new method. *Histochem.*, 66 (1980), 19–34.
DIXON, R., BAINES, P., ROSENDAAL, M., Marrow from 5–FU–treated mice preferentially repopulates marrow (rather than spleen) of lethally irradiated recipients. *Exp. Hematol.*, 7 Suppl. 6 (1979), 30.
DUBUISSON, D., FITZGERALD, M., WALL, P. D., Ameboid receptive fields of cells in laminae 1, 2 and 3. *Brain Res.*, 177 (1979), 376–8.
DUBUISSON, D., WALL, P. D., Medullary raphe influences on units in laminae 1 and 2 of cat spinal cord. *J. Physiol.*, 300 (1980), 33 P.
FRIES, W., ZEKI, S. M., Effect of bilateral prestriate cortex (V4) lesions on wavelength discrimination in monkeys. *Pflügers Arch.* (1979), R46.
GABELLA, G., Inpocketings of the cell membrane (caveolae) in the rat myocardium. *J. Ultrastruct. Res.*, 65 (1978), 135–47.
Smooth muscle cell junctions and structural aspects of contraction. *Br. Med. Bull.*, 35 (1979), 213–8.
Hypertrophic smooth muscle. I. Size and shape of cells, occurrence of mitosis. *Cell Tiss. Res.*, 201 (1979), 63–78.
Hypertrophic smooth muscle. II. Sarcoplasmic reticulum, caveolae and mitochondria. *Cell Tiss. Res.*, 201 (1979), 79–92.
Hypertrophic smooth muscle. III. Increase in number and size of gap junctions. *Cell Tiss. Res.*, 201 (1979), 263–76.
Hypertrophic smooth muscle. IV. Myofilaments, intermediate filaments and some mechanical properties. *Cell Tiss. Res.*, 201 (1979), 277–88.
Innervation of the gastrointestinal tract. *Int. Rev. Cytol.*, 59 (1979), 129–93.
GABELLA, G., BLUNDELL, D., Nexuses between the smooth muscle cells of the guinea-pig ileum. *J. Cell Biol.*, 82 (1979), 239–47.

JACKOWSKI, A., LIEBERMAN, A. R., Axonal growth cones of chick embryo retinal ganglion cells. *J. Anat.*, 129 (1979), 866–8.

JESSEN, K. R., BURNSTOCK, G., (with Mirsky, R., Dennison, M.), GABA may be a neurotransmitter in the vertebrate peripheral nervous system. *Nature*, 281 (1979), 71–4.

(with Polak, J. M., Van Noorden, S., Bryant, M. G., Bloom, S. R.), A new approach to the demonstration of the enteric plexus origin of peptide-containing nerves by immunocytochemistry and radioimmunoassay. *Gastroenterology*, 76 (1979), 1161.

(with Polak, J. M., Van Noorden, S., Bloom, S. R.), Peptide-containing neurons connect the two ganglionated plexuses of the enteric nervous system. *Nature*, 283 (1980), 391–3.

LIEBERMAN, A. R., Cell body responses of vertebrate neurons to axonal injury. 'Cellular Mechanisms in Axonal Growth', ed. R. P. Veraa, B. Graftstein and R. Ross. Proc. IVth Biennial Conference on Regeneration in the Central Nervous System. *Exp. Neurol.*, 64 (1979), 649–98.

(with Parnavelas, J. G.), An ultrastructural study of the maturation of neuronal somata in the visual cortex of the rat. *Anat. Embryol.*, 157 (1979), 311–28.

Preliminary evidence for a phase of hypertrophy during the postnatal development of cortical non-pyramidal cells. *J. Anat.*, 130 (1980), 644–5.

MERRILL, E. G., WALL, P. D., Selective inhibition of distant afferent input to lamina 4 and 5 cells in cat dorsal spinal cord. *J. Physiol.*, 278 (1978), 51P.

MERRILL, E. G., WALL, P. D., YAKSH, T. L., Properties of two unmyelinated fibre tracts of the central nervous system: lateral lissauer tract, and parallel fibres of the cerebellum. *J. Physiol.*, 284 (1978), 127–45.

NEVE, M., The Young Humphry Davy: his missing medical career. *Davy Bicentenary Symposium*. The Royal Institution 1980.

O'BRIEN, R. A. D., VRBOVÁ, G., Nerve-muscle interactions during early development. *Plasticity of Muscle*, ed. D. Pette. Berline: De Gruyter, 1980, 271–81.

O'BRIEN, R. A. D., ÖSTBERG, A. J. C., VRBOVÁ, G., Structural and functional changes in developing rat skeletal muscle induced *in vitro*. *J. Physiol.*, 295 (1979), 92 P.

OHARA, P. T., LIEBERMAN, A. R., Experimental identification and synaptic relationships of terminals of corticofugal afferents to the visual portion of the thalamic reticular nucleus in the albino rat. *J. Anat.*, 129 (1979), 863–5.

OHARA, P. T., WADE, C. R., LIEBERMAN, A. R., Calcium storage sites in axon terminals and other components of intact C.N.S. tissue: studies with a modified pyroantimonate technique. *J. Anat.*, 129 (1979), 869–70.

O'KEEFE, J., A review of the hippocampal place cells. *Prog. in Neurobiol.*, 13 (1979), 419–39.

O'KEEFE, J., NADEL, L., (with Willner, J.), Turning out irrelevancy? Comments on Soloman's temporal mapping view of the hippocampus. *Psychological Bulletin*, 86 (1979), 1280–9.

ÖSTBERG, A. J. C., (with Gaze, R. M., Keating, M. J., Chung, S.–H.), The relationship between retinal and tectal growth in larval *Xenopus:* implications for the development of the retino-tectal projection. *J. Embryol. exp. Morph.*, 53 (1979), 103–43.

QUILLIAM, T. A., Nerve fibres and free nerve endings in the epidermis of seven mammalian and one reptilian species. *The Skin of Vertebrates*, ed. R. Spearman. London: Academic Press, 1980, 293–301.

QUILLIAM, T. A., SADRZADEH, M. H., Receptors in the snout of *erinaceus europaeus*. *Anat. Rec.*, 196 (1980), 247.

STERN, C. D., A re-examination of mitotic activity in the early chick embryo. *Anat. & Embryol.*, 156 (1979), 319–29.

STERN, C. D., (with Jaffe, L. F.), Strong electrical currents leave the primitive streak of chick embryos. *Science,* 206 (1979), 569–71.

TURIN, L., WARNER, A. E., Intracellular pH in early xenopus embryos: its effects on current flow between blastomeres. *J. Physiol.,* 300 (1980), 489–504.

VRBOVÁ, G., Influence of activity in some characteristic properties of slow and fast mammalian muscles. *Exercise and Sport Sciences Reviews,* 7 (1979), 181–213.

(with Ashhurst, D. E.), Experimentally induced differentiation of slow tonic and fast twitch muscles in the chick. *F. Cell Sci.,* 36 (1979), 137–54.

(with Gordon, T., Niven-Jenkins, N.), Observations on neuromuscular connection between the vagus nerve and skeletal muscle. *Neuroscience,* 5 (1980), 597–611.

(with Pette, D., Whalen, R. C.), Independent development of contractile properties and myosin light chains in embryonic chick fast and slow muscle. *Pflügers Arch.,* 378 (1979), 251–7.

(with Nemeth, P. M., Pette, D.), Malate dehydrogenase homogeneity of single fibers of the motor unit. *Plasticity of Muscle,* ed. D. Pette. Berlin: De Gruyter, 1980, 45–54.

Malate dehydrogenase activity indicating metabolic homogeneity of single fibres of the motor unit. *J. Physiol.,* 301 (1980), 73 P.

WADE, C. R., OHARA, P. T., LIEBERMAN, A. R., Calcium localization in normal and degenerating myelinated nerve fibres of the C.N.S. *J. Anat.,* 130 (1980), 641–4.

WALL, P. D., Changes in damaged nerve and their sensory consequences. *Advances in Pain Research and Therapy,* Vol. 3, ed. J. J. Bonica *et al.* New York: Raven Press, 1979, 39–52.

Three phases of evil: the relation of injury to pain. *Brain & Mind,* Ciba Foundation, Series 69 (new series), Excerpta Medica. Amsterdam: Elsevier/North Holland, 1979, 293–333.

The role of substantia gelatinosa as a gate control. *Pain,* ed. J. J. Bonica. New York: Raven Press, 1980, 205–31.

Substantia gelatinosa and the control of somato-sensory transmission. *Int. Rehab. Med.,* 1 (1979), 106–10.

On the relation of injury to pain. The John J. Bonica Lecture. *Pain,* 6 (1979), 253–64.

(with Carlen, P. L., Nadvorna, M. D., Steinbach, T.), Phantom limbs and related phenomena in recent traumatic amputations. *Neurology,* 28 (1978), 211–7.

(with Devor, M.), Reorganisation of spinal cord sensory map after peripheral nerve injury. *Nature,* 275 (1978), 75–6.

Chronically sectioned peripheral nerves evoke decreased dorsal root potentials. *J. Physiol.,* 300 (1980), 42 P.

(with Devor, M., Schonfeld, D., Seltzer, Z.), Two modes of cutaneous reinnervation following peripheral nerve injury. *J. Comp. Neur.,* 185 (1979), 211–20.

(with Mendell, L. M., Sassoon, E. M.), Properties of synaptic linkage from long ranging afferents on to dorsal horn neurones in normal and deafferented cats. *J. Physiol.,* 285 (1978), 299–310.

WALL, P. D., MERRILL, E. G., YAKSH, T. L., Responses of single units in laminae 2 and 3 of cat spinal cord. *Brain Res.,* 160 (1979), 245–60.

WALL, P. D., SCADDING, J. W., TOMKIEWICZ, M. M., (with Devor, M., Inbal, R., Schonfeld, D., Seltzer, Z.), Autotomy following peripheral nerve lesions: experimental anaesthesia dolorosa. *Pain,* 6 (1979), 103–13.

The production and prevention of experimental anesthesia dolorosa. *Pain,* 6 (1979), 175–82.

WARNER, A. E., Consequences of cell to cell signals in the early embryo. *The Role of Intercellular Signals: Navigation, Encounter, Outcome,* ed. J. G. Nicholls, Verlag Chemie, Berlin Dahlem Konferenzen, (1979), 179–200.

(with Rink, T. J., Tsien, R. Y.), Free calcium in Xenopus embryos measured with ion-selective microelectrodes. *Nature,* 283 (1980), 658–60.

ZEKI, S., Zu Brodmanns Area 18 und Area 19. *Exp. Brain Res.,* 36 (1979), 195–7.

Functional specialization and binocular interaction in the visual areas of rhesus monkey prestriate cortex. *Proc. Roy Soc. Lond. B.,* 204 (1979), 379–97.

The response properties of cells in the middle temporal area of owl monkey visual cortex. *Proc. Roy. Soc. Lond. B.,* 207 (1980), 239–48.

A function of the corpus callosum in the Siamese cat. *Proc. Roy. Soc. Lond. B.,* 207 (1980), 249–58.

A direct projection from area VI to area V3A of rhesus monkey visual cortex. *Proc. R. Soc. Lond. B.,* 207 (1980), 499–506.

The representation of colours in the cerebral cortex. *Nature,* 284 (1980), 412–8.

## BIOCHEMISTRY

ASONGANYI, T. M., MEADOW, PAULINE M., Biosynthesis of the core part of the lipopolysaccharide of *Pseudomonas aeruginosa. J. gen. Microbiol.,* 117 (1980), 1–7.

BATES, EDNA J., SAGGERSON, E. D., A study of the glycerol phosphate acyltransferase and dihydroxyacetone phosphate acyltransferase activities in rat liver mitochondrial and microsomal fractions. *Biochem. J.,* 182 (1979), 751–62.

BUTTERWORTH, P. H. W., (with Jenkins, J. R., Bishop, J. O.), Molecular cloning of three major sequence species from Rainbow trout protamine mRNA. *Nucleic Acids Research,* 6 (1979), 3805–20.

(with Tillyer, C. R.), Dexamethasone enhancement of the induction of cells bearing receptors for IgM in human peripheral blood lymphocyte culture. *Clin. exp. Immunol.,* 40 (1980), 178–85.

BUXTON, D. B., MOWBRAY, J., A salt-washed ribosome preparation from rat cardiac muscle with enhanced initiation activity. *Biochem. Soc. Trans.,* 8 (1980), 360–1.

CLARKE, PATRICIA H., Experiments in microbial evolution: new enzymes, new metabolic activities (The Leeuwenhoek Lecture, 1979). *Proc. R. Soc. Lond.,* B 207 (1980), 385–404.

CLORE, G. M., (with Andréasson, L.–E., Karlsson, B., Aasa, R., Malmström, B. G.), Characterization of the low-temperature intermediates of the reaction of full reduced soluble cytochrome oxidase with oxygen by electron-paramagnetic-resonance and optical spectroscopy. *Biochim. J.,* 185 (1980), 139–54.

Studies of the reaction of cytochrome *c* oxidase with oxygen at low temperature. *Acta Chem. Scand.,* B 33 (1979), 615–8.

CLORE, G. M., CHANCE, E. M., CO binding to mitochondrial mixed valence state cytochrome oxidase at low temperatures. *Biochem. Biophys. Acta.,* 590 (1980), 34–49.

CLORE, G. M., LANE, A. N., HOLLAWAY, M. R., The kinetics of the reaction of aquo fe (III) myoglobin with hydrogen peroxide at pH 8. *Inorganica Chimica Acta.,* 46 (1980), 139–46.

COOPER, M. B., CRAFT, J. A., ESTALL, MARGARET R., RABIN, B. R., The biosynthesis of cytochrome P450 by heavy and light rough endoplasmic reticulum of rat liver. *Biochem. Biophys. Res. Commun.,* 91 (1979), 95–101.

CROMPTON, M., The activation of the sodium-calcium carrier of cardiac mitochondria by potassium. *First European Bioenergetics Conference, Short Reports.* Bologna: Patron Editore, 1980, 269.

The sodium ion/calcium ion cycle of cardiac mitochondria. *Biochem. Soc. Trans.*, 8 (1980), 261–2.

(with Heid, I., Carafoli, E.), The activation by potassium of the sodium-calcium carrier of cardiac mitochondria. *FEBS Lett.*, 115 (1980), 257–9.

(with Nicholls, D. G.), Mitochondrial calcium transport. *FEBS Lett.*, 111 (1980), 261–8.

(with Roos, I., Carafoli, E.), The role of inorganic phosphate in the release of calcium from rat liver mitochondria. *First European Bioenergetics Conference, Short Reports.* Bologna: Patron Editore, 1980, 297.

DREW, R. E., CLARKE, PATRICIA H., The construction in vitro of derivatives of bacteriophage lambda carrying the amidase genes of *Pseudomonas aeruginosa. Molec. gen. Genet.*, 177 (1980), 311–20.

FERNANDEZ-FEO, NANCY DE, SAGGERSON, E. D., Nonesterified fatty acids oppose insulin activation of acetyl CoA carboxylase in rat adipocytes incubated with glucose. *Int. J. Biochem.*, 11 (1980), 295–7.

GREENBAUM, A. L., (with Hothersall, J. S., Baquer, N. Z., McLean, Patricia), Alternative pathways of glucose utilization in brain. Changes in the pattern of glucose utilization in brain during development and the effect of phenazine methosulphate on the integration of metabolic routes. *Arch. Biochem. Biophys.*, 198 (1979), 478–92.

HARSON, MOIRA M., WILLIAMS, D. J., Synthesis and secretion of albumin in rats during treatment with a carinogenic dose of N-2-acetylaminofluorene. *Br. J. Cancer*, 40 (1979), 791–7.

HOLLAWAY, M. R., TICHO, TAMARA, A competition time-course method for following enzymic reactions applied to the hydrolysis of acetamide catalysed by an aliphatic amidase. *FEBS Lett.*, 106 (1979), 185–8.

HOLLAWAY, M. R., NUNN, JULIA D., (with Rodriguez, H. B., Hood, K., Simpson, I.), Effector-induced conformational transitions in muscle phosphofructokinase. *Proc. FEBS 12th Meeting, Dresden*, Vol. 52, Oxford: Pergamon Press, 1979, 377–88.

HOLLAWAY, M. R., (with Birch, G. G., Latymer, Z.), Intensity/time relationships in sweetness: evidence for a queue hypothesis in taste chemoreception. *Chemical Senses*, 5 (1980), 63–78.

HOLLAWAY, M. R., (and others), Studies on the mechanism of action of reactions catalysed by ethanolamine-ammonia lyase. *Vitamin $B_{12}$*, ed. B. Zagalak and W. Friedrich. New York: De Gruyter, 1979, 471–84.

HONNOR, R. C., SAGGERSON, E. D., Altered lipolytic response to glucagon and adenosine deaminase in adipocytes from starved rats. *Biochem. J.*, 188 (1980), 757–61.

JOHNSTON, I. R., (with Assairi, Liliane M.), A DNA-dependent ATPase of calf-thymus. *Eur. J. Biochem.*, 99 (1979), 71–9.

JONES, C. J., (with Mann, G. E., Smaje, L. H.), The role of cyclic nucleotides and related compounds in nerve-mediated vasodilatation in the cat submandibular gland. *Br. J. Pharmac.*, 68 (1980), 485–97.

KENNEDY, D. F., MATHIAS, A. P., Characterization of rat liver nuclei isolated in anhydrous media and their fractionation using non-aqueous gradients. *Biochem. Pharm.*, 28 (1979), 1857–64.

KESSAR, PREMINDA, SAGGERSON, E. D., Evidence that catecholamines stimulate renal gluconeogenesis through an $\alpha_1$-type of adrenoceptor. *Biochem. J.*, 190 (1980), 119–23.

LAVERACK, P. D., CLARKE, PATRICIA H., Selection of mandelamidase constitutive mutants in continuous culture of *Pseudomonas putida. Biotechnology Letters*, 1 (1979), 353–8.

LAVERACK, P. D., CLARKE, PATRICIA H., RAHMAN, M., The catabolism of arginine by *Pseudomonas aeruginosa. J. gen Microbiol.,* 116 (1980), 371–80.

MATHIAS, A. P., (with Evans, I. H.), The fractionation of suspensions of isolated hepatocytes by rate zonal centrifugation. *Biochim. Biophys. Acta,* 628 (1980), 480–8.

PALACIOS-ROMERO, RUBÉN, MOWBRAY, JOHN, Evidence for the rapid direct control both *in vivo* and *in vitro* of the efficiency of oxidative phosphorylation by 3,5,3′-tri-iodo-L-thyronine in rats. *Biochem. J.,* 184 (1979), 527–38.

PATERSON, A., CLARKE, PATRICIA H., Molecular basis of altered enzyme specificities in a family of mutant amidases from *Pseudomonas aerugina. J. gen. Microbiol.,* 114 (1979), 75–85.

PHILLIPS, I. R., (and others), Reassessment of histone gene expression during the cell cycle in human cells using homologous H4 histone cDNA. *J. Cell Biol.,* 83 (1979), 421a.

Reassessment of histone gene expression during cell cycle in human cells by using homologous H4 histone cDNA. *Proc. Natl. Acad. Sci. USA,* 76 (1979), 4995–9.

Multiple forms of H4 histone mRNA in human cells. *Proc. Natl. Acad. Sci. USA,* 77 (1980), 1942–6.

PHILLIPS, I. R., SHEPHARD, ELIZABETH A., (with Stein, J. L., Kleinsmith, L. J., Stein, G. S.), Nuclear protein kinase activities during the cell cycle of HeLa $S_3$ cells. *Biochim. Biophys. Acta,* 565 (1979), 326–46.

PHILLIPS, I. R., SHEPHARD, ELIZABETH A., (with Tatcher, W. B., Stein, J. L., Stein, G. S.), Evidence for nonhistone chromosomal protein kinase activity associated with nucleosomes isolated from HeLa $S_3$ cells. *FEBS Lett.,* 106 (1979), 56–62.

RAHMAN, M., CLARKE, PATRICIA H., Genes and enzymes of lysine catabolism in *Pseudomonas aeruginosa. J. gen. Microbiol.,* 116 (1980), 357–69.

REES, DOROTHY E., The mechanism of induction of the microsomal drug hydroxylating system in rat liver by phenobarbital. *Gen. Pharmac.,* 10 (1979), 341–50.

SAGGERSON, E. D., Increased antilipolytic effect of the adenosine 'R-site' agonist $N^6$-(phenylisopropyl) adenosine in adipocytes from adrenalectomized rats. *FEBS Lett.,* 115 (1980), 127–8.

(with Rodin, D. A., Rodin, R. A.), Stimulation of gluconeogenesis by adenosine in renal cortical tubule fragments from fed rats. *Biochem. Pharm.,* 29 (1980), 828–9.

SAGGERSON, E. D., CARPENTER, CAROL A., Quabain and $K^+$ removal blocks α-adrenergic stimulation of gluconeogenesis in tubule fragments from fed rats. *FEBS Lett.,* 106 (1979), 189–92.

SAGGERSON, E. D., CARPENTER, CAROL A., CHENG, C. H. K., SOORANNA, S. R., Subcellular distribution and some properties of *N*-ethylmaleimide-sensitive and -insensitive forms of glycerol phosphate acyltransferase in rat adipocytes. *Biochem. J.,* 190 (1980), 183–9.

SAGGERSON, E. D., KESSAR, PREMINDA, CARPENTER, CAROL A., Regulation of renal gluconeogenesis by α-adrenergic action. *Int. J. Biochem.,* 12 (1980), 107–11.

SAGGERSON, E. D., SOORANNA, S. R., BATES, EDNA J., CHENG, C. H. K., Rapid effects of hormones on enzymes of lipid metabolism. *Biochem. Soc. Trans.,* 7 (1979), 854–7.

SAGGERSON, E. D., SOORANNA, S. R., CHENG, C. H. K., Rapid hormonal control of enzymes of triacylglycerol synthesis in rat adipocytes. *INSERM,* 87 (1979), 223–38.

SHEPHARD, ELIZABETH A., (and others), Cloned human H4 histone sequences. *J. Cell Biol.,* 83 (1979), 195a.

Regulation of histone gene expression in HeLa $S_3$ cells. *Arch. Biol. Med. Exper.*, 12 (1979), 439–55.

SMITH, SUSAN J., SAGGERSON, E. D., Regulation of pyruvate dehydrogenase activity in white adipocyte mitochondria by palmitoyl carnitine and citrate. *Int. J. Biochem.*, 10 (1979), 785–90.

SOORANNA, S. R., SAGGERSON, E. D., Inactivation of rat adipocyte pyruvate dehydrogenase by palmitate. *Biochem. J.*, 184 (1979), 59–62.

THOMAS, K. D., MOWBRAY, J., An isolated ribosome preparation from cardiac muscle which retains effects of insulin pretreatment. *Biochem. Soc. Trans.*, 8 (1980), 359–60.

## BIOPHYSICS

ABE, T., ALEMÁ, S., MILEDI, R., On the purification of β-bungarotoxin. *Proc. R. Soc.* B 207 (1980), 487–90.

ALVAREZ-LEEFMANS, F. J., De SANTIS, A., MILEDI, R., Effects of some divalent cations on synaptic transmission in frog spinal neurons. *J. Physiol.*, 294 (1979), 387–406.

ALVAREZ-LEEFMANS, F. J., MILEDI, R., Voltage sensitive calcium channels in frog spinal motoneurones. *J. Physiol.*, 295 (1979), 81–2.

ASHMORE, J. F., FALK, G., Responses of rod bipolar cells in the dark-adapted retina of the dogfish, *Scyliorhinus canicula*. *J. Physiol.*, 300 (1980), 115–50.

The single-photon signal in rod bipolar cells of the dogfish retina. *J. Physiol.*, 300 (1980), 151–66.

CARATSCH, C. G., MARANDA, B., MILEDI, R., STRONG, P. N., Properties of antibody to chemically modified (phospholipase-inactive) β-bungarotoxin. *Neurosci. Letts. Suppl.* 3 (1979), 183.

Neuromuscular action of β-bungarotoxin after inhibition of its phospholipase activity. *Neurosci. Letts. Suppl.*, 3 (1979), 217.

Binding properties of β-bungarotoxin at the neuromuscular junction, *Toxicon*, 17 (1979), 20s.

CULL-CANDY, S. G., MILEDI, R., UCHITEL, O. D., Induction of action potentials in cultured slow muscle fibres of the frog. *J. Physiol.*, 299 (1980), 197–202.

CULL-CANDY, S. G., MILEDI, R., TRAUTMANN, A., UCHITEL, O. D., On the release of transmitter at normal, myasthenia gravis and myasthenic syndrome affected human end-plates. *J. Physiol.*, 299 (1980), 621–38.

CULL-CANDY, S. G., MILEDI, R., Factors affecting the channel kinetics of glutamate receptors in locust muscle fibres. *Receptors for neurotransmitters, hormones and pheromones in Insects*, ed. D. B. Satelle et al. Elsevier/North Holland Biomedical Press, 1980, 161–73.

EUSEBI, F., MILEDI, R., TAKAHASHI, T., Calcium transients in mammalian muscles. *Nature*, 284 (1980), 560–1.

FULTON, B. P., MILEDI, R., SZCZEPANIAK, A. C., Effects of a Dendroaspis neurotoxin on synaptic transmission in the spinal cord and the neuromuscular junction of the frog. *Proc. R. Soc.*, 207 (1980), 491–7.

FULTON, B. P., MILEDI, R., TAKAHASHI, T., Electrical synapses between motoneurons in the spinal cord of the newborn rat. *Proc. R. Soc. Lond.* B 108 (1980), 115–20.

HARRIS, E. J., (with Baum, H.), Production of thiol groups and retention of calcium ions by cardiac mitochondria. *Biochem. J.*, 186 (1980), 725–32.

Mitochondrial $Ca^{2+}$ efflux: stimulation by mercurial reversed by ubiquinone. *Trans. Biochem. Soc.*, 8 (1980), 336–7.

KATZ, B., Elementary components of synaptic transmission. *Naturwissenschaften,* 66 (1979), 606–10.

Die funktionsmechanismen der synapse. *Mannheimer Forum,* 1979/80, 9–89.

KATZ, B., MILEDI, R., Estimates of quantal content during 'chemical potentiation' of transmitter release. *Proc. R. Soc. Lond.,* B 205 (1979), 369–78.

Blockade of endplate responses by intracellular application of procaine. *Ontogenesis and functional mechanisms of peripheral synapses,* ed. J. Taxi, Elsevier/North Holland, 1980, 171–8.

MILEDI, R., PARKER, I., SCHALOW, G., Transmitter induced calcium entry across the post-synaptic membrane at frog end-plates measured using Arenazo III. *J. Physiol.,* 300 (1980), 197–212.

MILEDI, R., PARKER, I., SCHALOW, G., Transition temperature of excitation-contraction coupling in frog twitch muscle fibres. *Nature,* 280 (1979), 326–8.

MOLENAAR, P. C., POLAK, R. L., MILEDI, R., ALEMÁ, S., VINCENT, A., NEWSOM-DAVIS, J., Acetylcholine in intercostal muscle from myasthenia gravis patients and in rat diaphragm after blockade of acetylcholine receptors. *Progress in Brain Research,* ed. S. Tucek. Holland: Elsevier Scientific Publ. Co., 1979, 349–458.

NIEDERGERKE, R., PAGE, S., The hypodynamic condition of the frog heart. *N. S. Arch. Pharmac.,* 308, 1979, R5.

STRONG, P. N., (with Kelly, R. B., von Wedel, R. J.), Phospholipase dependent and phospholipase independent inhibition of transmitter release by β-bungarotoxin. *Neurotoxins, Tools in Neurobiology,* ed. B. Ceccarelli and F. Clementi. New York: Raven Press, 1979, 77–85.

## GENETICS AND BIOMETRY

ADINOLFI, A., HOPKINSON, D. A., Affinity electrophoresis of human alcohol dehydrogenase (ADH) isozymes. *Ann. Hum. Genet., Lond.,* 43 (1979), 109–19.

BENER, A., Determination of parental heterozygosity in dermatoglyphic characters. *Hum. Hered.,* 30 (1980), 89–93.

Search for linkage between dermatoglyphic sole characters and blood groups. *Hum. Hered.,* 30 (1980), 215–20.

BENER, A., ERK, F. C., The analysis of whorls on specific fingertips with respect to sex, bilateral asymmetry, and genetic relationship. *Ann. Hum. Biol.,* 6 (1979), 349–56.

BENER, A., SMITH, C. A. B., (with Loesch, D.), Simplified formulas for detecting linkage with a quantitative character. *Ann. Hum. Genet., Lond.* 43 (1980), 249–54.

BERRY, R. J., Genetical factors in animal population dynamics. *Population Dynamics,* ed. J. M. Anderson, R. Turner and L. R. Taylor. Oxford: Blackwell, 1979, 53–80.

Genes, pollution and monitoring. *Biological Effects of Marine Pollution and the Problems of Monitoring,* ed. A. D. McIntyre and J. B. Pearce, Rapp.P.-v.Reun. Cons.int.Explor.Mer., 179 (1980), 253–7.

The Outer Hebrides: where genes and geography meet. *Proc. R. Soc. Edin.,* 77B (1979), 21–43.

Wildlife introductions to Great Britain – some policy implications for nature conservation. *Biologist,* 26 (1979), 183–4.

Genes and skeletons, ancient and modern. *J. Hum. Evol.,* 8 (1979), 669–77.

The great mouse festival. *Nature, Lond.,* 283 (1980), 15–6.

(with Bonner, W. N., Peters, J.), Natural selection in house mice from South Georgia (South Atlantic Ocean). *J. Zool., Lond.,* 189 (1979), 385–98.

(with Johnston, J. L.), *The Natural History of Shetland.* London: Collins New Naturalist, (1980), 380.

CARRITT, B., POVEY, S., Regional assignments of the loci $AK_3$, $ACON_5$, and *ASS* on human chromosome 9. *Cytogenet. Cell Genet.,* 23 (1979), 171–81.

CARRITT, B., POVEY, S., (with Mohandas, T., Sparkes, R. S.), Regional assignments of the loci $AK_3$, $ACO_1$ and *GALT* on chromosome 9. *Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV,* 11, 1979. New York: The National Foundation, 140.

COOK, P. J. L., NOADES, J. E., (with Buckton, K. E., Lindenbaum, R. H.), Exclusion mapping of *MNS* and *GPT. Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV,* 11, 1979. New York: The National Foundation, 143.

COOK, P. J. L., NOADES, J. E., ROBSON, E. B., (with Lomas, C. G., Buckton, K. E.), Exclusion mapping illustrated by the $MNS_5$ blood group. *Ann. Hum. Genet. Lond.,* 44 (1980), 61–73.

CORNEY, G., SEEDBURGH, D., (with Thompson, B., Campbell, D. M., McGillivray, I., Timlin, D.), Maternal height and twinning. *Ann. Hum. Genet. Lond.,* 43 (1979), 55–9.

DELHANTY, J. D. A., PRITCHARD, M. B., (with Bussey, H. J. R., Morson, B. C.), Tetraploid fibroblasts and familial polyposis coli. *Lancet,* I (1980), 1365.

DEOL, M. S., Genetic malformations of the inner ear in the mouse and in man. *Morphogenesis and malformations of the ear,* ed. R. J. Gorlin and D. Bergsma. *Birth Defects: Original Article Series, XV,* 1980. New York: The National Foundation.

EDWARDS, Y. H., HOPKINSON, D. A., Further characterisation of the fumarase variant FH 2–1. *Ann. Hum. Genet. Lond.,* 43 (1979), 101–6.

EDWARDS, Y. H., POTTER, J., HOPKINSON, D. A., Human FAD-dependent NAD (P)H diaphorase. *Biochem. J.,* 187 (1980), 429–36.

EDWARDS, Y. H., TIPLER, T., HOPKINSON, D. A., (with Carter, N., Jeffery, S., Sheils, A.), Characterization of human carbonic anhydrase III from skeletal muscle. *Biochem. Genet.,* 17 (1979), 837–54.

HOPKINSON, D. A., Problems in the identification of parasites and their vectors. Introduction. *Symposia of the British Society for Parasitology* Vol. 17. ed. A. E. R. Taylor and R. Muller. London: Blackwell Scientific Publications (1979), 1–6.
(with Spencer, N.), Biochemical genetics of the pentose phosphate cycle: human ribose 5-phosphate isomerase (RPI) and ribulose 5-phosphate 3-epimerase (RPE). *Ann. Hum. Genet. Lond.,* 43 (1980), 335–42.

INWOOD, M., POVEY, S., DELHANTY, J. D. A., Comparison of isozymes in fetal, adult and transformed fibroblasts. *Cell Biol. Int. Rep.,* 4 (1980), 327–5.

JAMES, W. H., Is Weinberg's differential rule valid? *Acta Geneticae Medicae et Gemellologiae,* 28 (1979), 69–71.
The sexes of affected cases in sibships containing two or more members with anencephaly or spina bifida. *J. Med. Genet.,* 16 (1979), 306–8.
The sex ratio in spina bifida. *J. Med. Genet.,* 16 (1979), 384–8.
Maternal age, dizygotic twinning rates and age at menopause. *Ann. Hum. Biol.,* 6 (1979), 481–3.
The gestational age in twins. *Arch. Dis. Child.,* 55 (1980), 281–4.
Concordance rates for twins in anencephaly. *J. Med. Genet.,* 17 (1980), 93–4.
Time of fertilisation and sex of infants. *Lancet,* I (1980), 1124–6.

JONES, J. S., Evolutionary genetics of snails. *Nature, Lond.,* 285 (1980), 283–4.

KALMUS, H., Differences in adaptation and colour sensation between the eyes of a patient with latent ocular herpes. *Colour Vision Deficiencies V:* Chapter 6, Bristol: Adam Hilger Ltd. (1980), 314–6.

(with Fry, D. B.), On tune deafness (dysmelodia): frequency, development, genetics and musical background. *Ann. Hum. Genet. Lond.*, 43 (1980), 369–82.

KING, J., ROBSON, E. B., EDWARDS, Y. H., COOK, P. J. L., (with Buckton, K. E.), Miscellaneous contributions to the mapping of chromosome 1. *Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV, 11, 1979.* New York: The National Foundation, 172.

LUSH, I. E., (with Jamil, T.), On the hydroxylation of fluoran to form fluorescein by three species of Gerbillinae *(Meriones unguiculatus, M. libycus* and *Gerbillus pyramidum.) Comp. Biochem. Physiol.* 64C (1979), 249–53.

MITTWOCH, U., Early testicular development in sex reversed mice. *Anat. Embryol.*, 157 (1979), 177–9.

MITTWOCH, U., MAHADEVAIAH, S., Comparison of development of human fetal gonads and kidneys. *J. Reprod. Fert.*, 58 (1980), 463–7.

MORO-FURLANI, A. M., TURNER, V. S., HOPKINSON, D. A., Genetical and biochemical studies on human phosphoserine phosphatase. *Ann. Hum. Genet. Lond.*, 43 (1980), 323–33.

NOADES, J. E., CORNEY, G., COOK, P. J. L., (with others), The Scianna blood group lies distal to uridine monophosphate kinase on chromosome 1p. *Ann. Hum. Genet. Lond.*, 43 (1979), 121–32.

PARRINGTON, J., WEST, L., POVEY, S., Gene mapping from ovarian teratomas. *Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV, 11, 1979.* New York: The National Foundation, 196.

POVEY, S., EVANS, M. W., (with others), Genetic studies of complete and partial hydatidiform moles. *Lancet,* II (1979), 580.

POVEY, S., INWOOD, M., (with Tanyar, A., Bobrow, M.), The expression of creatine kinase isozymes in human cultured cells. *Ann. Hum. Genet. Lond.*, 43 (1979), 15–26.

The expression of the BB isozyme of creatine kinase. *Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV, 11, 1979.* New York: The National Foundation, 198.

POVEY, S., JEREMIAH, S. J., BARKER, R. F., HOPKINSON, D. A., CARRITT, B., ROBSON, E. B., COOK, P. J. L., (with Solomon, E., Bobrow, M.), The current position of *PGP. Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV, 11, 1979.* New York: The National Foundation, 199.

POVEY, S., JEREMIAH, S. J., HOPKINSON, D. A., BARKER, R. F., ROBSON, E. B., COOK, P. J. L., CARRITT, B., (with Solomon, E., Bobrow, M., Buckton, K. E.), Assignment of the human locus determining phosphoglycolate phosphatase to chromosome 16. *Ann. Hum. Genet. Lond.*, 43 (1980), 241–8.

POVEY, S., JEREMIAH, S. J., (with others), Suppression and reappearance of N-tropic L virus production in somatic cell hybrids after introduction and loss of chromosomes carrying Fv-$1^b$. *Europ. J. Cancer,* 16 (1980), 357–68.

POVEY, S., (with others), Glutamic pyruvate transaminase phenotypes in polycythaemia rubra vera. *Brit. J. Haematol.*, 44 (1980), 407–13.

Association of Herpes Simplex thymidine kinase gene with chromosome 18 in transformed human cells. *J. Nat. Cancer Inst.*, 64 (1980), 241–8.

ROBSON, E. B., SMITH, C. A. B., (Editors), *Annals of Human Genetics,* London.

ROBSON, E. B., (with Lachmann, P. J., Hobart, M. J., Johnston, W. A.), Linkage studies in hereditary angio-edema. *J. Med. Genet.*, 16 (1979), 347–50.

(with Meera Khan, P.), Report of the Committee on the genetic constitution of chromosomes 7, 8 and 9. *Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV, 11, 1979.* New York: The National Foundation, 39–46.

ROGERS, P. A., HOPKINSON, D. A. (and others), Congenital haemolytic anaemia resulting from glucose phosphate isomerase deficiency: genetics, clinical picture, and prenatal diagnosis. *J. Med. Genet.*, 16 (1979), 189–96.

ROGERS, P. A., BRENTON, D. P., HOPKINSON, D. A., Changes in the activity and isozyme patterns of glycolytic enzymes during stimulation of normal human lymphocytes with phytohaemagglutinin. *Ann. Hum. Genet. Lond.*, 43 (1980), 213–26.

SMITH, C. A. B., Early reminiscences. *Graph Theory and Related Topics*, ed. J. A. Bondy and U. S. R. Murty. London: Academic Press, 1979, xix–xxi.

Search for major genetic effects through linkage and association. *Genetic analysis of common diseases: applications to predictive factors in coronorary disease*, ed. C. F. Sing and M. Skolnick. *Prog. in Clin. & Biol. Res.* New York: Alan Liss, 32 1979, 277–95.

Note on the forms of dermatoglyphic patterns. *Dermatoglyphics – Fifty years later*, ed. W. Wertelecki and C. C. Plato, *Birth Defects: Original Article Series, XV, No. 6.* New York: The National Foundation, 1979, 43–52.

Estimation of correlation between relatives. *Adv. Appl. Prob.*, 12 (1980), 8–9.

Estimating genetic correlations. *Ann. Hum. Genet., Lond.*, 43 (1980), 265–84.

SWALLOW, D. M., EVANS, L., (with others), Sialidosis Type 1: cherry red spot-myoclonus syndrome with sialidase deficiency and altered electrophoretic mobility of some enzymes known to be glycoproteins. II. Enzyme studies. *Ann. Hum. Genet., Lond.*, 43 (1979), 27–35.

SWALLOW, D. M., (with others), Deletion mapping: further evidence for the location of acid phosphatase ($ACP_1$) within 2p23. *Amer. J. Med. Genet.*, 4 (1979), 167–72.

(with others) Somatic cell genetics of human interferon production in human-rodent cell hybrids. *J. Gen. Virol.*, 45 (1979), 167–72.

Tentative assignment of the gene for human fibroblast interferon to chromosome 9. *Fifth International Workshop on Human Gene Mapping. Birth Defects: Original Article Series XV*, 11, 1979. New York: The National Foundation, 183.

Involvement of a gene on chromosome 9 in human fibroblast interferon production. *Nature*, 280 (1979), 493–5.

Sialidosis Type 1: cherry red spot-myoclonus syndrome with sialidase deficiency and altered electrophoretic mobilities of some enzymes known to be glycoproteins. *J. Neurol., Neurosurg., Psychiat.*, 42 (1979), 873–88.

TURNER, V. S., HOPKINSON, D. A., The use of meldolablue in isozyme stains after electrophoresis. *FEBS Lett.*, 105 (1979), 376–8.

## PHARMACOLOGY

ASSEM, E. S. K., (with Chong, E. K. S.), Effect of two new histamine antagonists (BM 15,100 and BM 06,001) on bronchial muscle and histamine release from leucocytes. *Monogr. Allergy*, 14 (1979), 310–2.

ASSEM, E. S. K., MONGAR, J. L., (with Bierman, C.), Inhibition and stimulation of histamine release by oxatomide. *Int. J. Immunopharm.*, 1 (1979), 227–31.

BLACK, J. W., BRADBURY, JEAN E., (with Whyllie, J. H.), Stimulation of colonic mucus output in the rat. *Br. J. Pharm.*, 66 (1979), 456.

BLACK, J. W., BRADBURY, JEAN E., (with Wyllie, J. H.), Stimulation of colonic mucus output in the rat. *Br. J. Pharm.*, 66 (1979), 456 P.

BRADBURY, JEAN E., BLACK, J. W., (with Wyllie, J. H.), Stimulation of colonic B. E. C., Brown, C., Burnstock, G.), Apamin blocks certain neurotransmitter-induced increases in potassium permeability. *Nature*, 282 (1979), 415–7.

COLQUHOUN, D., Competitive block and ion channel block as mechanisms of antagonist action on the skeletal muscle end-plate. *Receptors for Neurotransmitters and Peptide Hormones,* ed. G. Pepeu, M. J. Kuhar and S. J. Enna, *Adv. Biochem. Psychopharm,* 21. New York: Raven Press, 1980, 67–80.

COLQUHOUN, D., SHERIDAN, R. E., Modes of action of gallamine at the neuromuscular junction. *Br. J. Pharm.,* 66 (1979), 78–9 P.

Kinetic effects of tubocurarine on skeletal muscle at high agonist concentrations. *Brit. J. Pharm.,* 68 (1980), 143–4 P.

(with Dreyer, F.), The actions of tubocurarine at the frog neuromuscular junction. *J. Physiol.,* 293 (1979), 247–84.

CROUCHER, M. J., WEBSTER, R. A., Effects of uptake inhibitors on the efflux and metabolism of [$^{14}$C] -GABA in the guinea-pig cerebral cortex *in vivo. Br. J. Pharmac.,* 69 (1980), 324–5 P.

DALE, M. MAUREEN, (with Beets, J. L.), Inhibition of guinea-pig lymphocyte activation by histamine and histamine analogues. *Br. J. Pharm.,* 66 (1979), 365–72.

FOREMAN, J. C., (with Eckstein, F.), Actions of adenosine and guanosine $3^1:5^1$ cyclic phosphorothioates on histamine secretion. *FEBS Letts.,* 91 (1978), 182–5.

(with Ishizaka, T., Sterk, A. R., Ishizaka, K.), Induction of calcium flux across the rat mast cell membrane by bridging IgE receptors. *Proc. Nat. Acad. Sci. U.S.A.,* 76 (1979), 5858–62.

(with Lichtenstein, L. M.), Spontaneous histamine secretion from leukocytes in the presence of strontium. *J. Pharmacol. & Exp. Therapeutics,* 210 (1979), 75–81.

Clinical Pharmacology of acute allergic disorders. *Ann. Rev. Med.,* 31 (1980), 181–90.

Induction of histamine secretion by polycations. *Biochimica et Biophysica Acta,* 629 (1980), 587–603.

(with Lichtenstein, L. M., Conroy, M. C., Marone, G., Newball, H. H.), Differences between histamine release from rat mast cells and human basophils and mast cells. *The Mast Cell, its role in health and disease,* ed. J. Pepys and A. M. Edwards. Tunbridge Wells: Pitman Medical, 1979, 83–96.

(with Sobotka, A. K., Lichtenstein, L. M.), The action of strontium on basophil leukocytes and its use to probe the relationship between immunologic stimulus and secretory response. *J. of Immunol.,* 123 (1979), 153–9.

Modulation of the rate of histamine release from basophils by cyclic AMP. *Eur. J. Pharmacol.,* 63 (1980), 341–6.

HAYLETT, DENNIS G., The identification of the metabolic receptors for catecholamines. *Trends in Autonomic Pharmacology,* 1, ed. S. Kalsner. Baltimore-Munich: Urban & Schwarzenberg, 1979, 309–45.

JENKINSON, D. H., Partial agonists in receptor classification. *Proc. 6th Int. Symp. on Med. Chemistry,* ed. M. A. Simkins. Oxford: Cotswold Press, 1979, 373–83.

JORDAN, C. C., (with Cutting, D. A.), Baclofen as a potential analgesic agent. Proceedings of a symposium on Baclofen: a broader spectrum of activity. *Scottish Med. J. Suppl.,* ed. I. T. Boyle, R. V. Johnstone, and C. D. Forbes, (1980), 17–22.

JORDAN, C. C., OWEN, D. G., Dithiothreitol potentiates the depolarizing action of substance P in the frog spinal cord *in vitro. Br. J. Pharmac.,* 69 (1980), 285 P.

LAURENCE, D. R., Relationship between government and industry in clinical trials. *Issues in research with human subjects. US Dept. Health, Education and Welfare, NIH Publication No. 80–1585,* (1980), 156–66.

(with Bennett, P. N.), *Clinical Pharmacology* (5th edition), Edinburgh: Churchill-Livingston, 1980, 954 pp.

(with Vakil, B. J., Armitage, P., Clifford, R. E.), Therapeutic trial of intracisternal human tetanus immunoglobulin in clinical tetanus. *Trans. of Roy. Soc. Tropical Med. & Hygiene,* 73 (1979), 579–82.

MONGAR, J. L., (with Bierman, C. W.), Antihistamines. *Pediatric Pharmacology*, ed. S. J. Jaffe. New York: Grune & Stratton Inc., 1980, 472–8.

MONGAR, J. L., FOREMAN, J. C., Control of histamine secretion. *The mast cell – its role in health and disease*, ed. J. Pepys and A. M. Edwards. Tunbridge Wells: Pitman Medical, 1979, 30–7.

OGDEN, D. C., SIEGELBAUM, S. A., The action of benzocaine on voltage-clamped frog end-plates. *Br. J. Pharmac.*, 69 (1980), 336–7 P.

RANG, H. P., Synaptic currents of rat parasympathetic ganglion cells, *J. Physiol.*, 296 (1979), 74–5 P.

(with Ascher, P., Large, W. A.), Studies on the mechanism of action of acetylcholine antagonists on rat parasympathetic ganglion cells. *J. Physiol.*, 295 (1979), 139–70.

Two modes of action of ganglionic blocking drugs. *Br. J. Pharmac.*, 66 (1979), 79 P.

SCHILD, H. O., Recollections and reflections of an auto-pharmacologist. *Trends in Autonomic Pharmacology, 1.*, ed. Stanley Kalsner, Baltimore-Munich: Urban & Schwarzenberg, 1979, 1–18.

L'Ergot de seigle: des conceptions de Dale aux récepteurs. *J. Pharmac. (Paris)*, 10 (1979), 377–82.

Ormoni locali. *Enciclopedia del Novencento, IV*, Instituto dell'Enciclopedia Italiana (1979), 1031–44.

(with Berde, B.), (Editors), Ergot Alkaloids and related compounds. *Handbook of Experimental Pharmacology, 49*, Heffter Heubner New Series, Springer-Verlag, 1978, 1003 pp.

SHORES, AILSA J., MONGAR, J. L., Modulation of histamine secretion from concanavalin A-activated rat mast cells by phosphatidyl serine, calcium, cAMP, pH and metabolic inhibitors. *Agents & Actions*, 10 (1980), 131–7.

STEINBERG, HANNAH, (with Harrison-Read, P. E.), Tricyclic antidepressant drugs and individual differences in the exploratory activity of rats: contrasting effects of tertiary and secondary amine compounds. *Psychopharmacology*, 69 (1980), 85–91.

(with Silverman, A. P.), Nitrous oxide in practical classes. *Br. J. Pharmac.*, 63 (1978), 409 P.

VELLUCCI, SANDRA V., WEBSTER, R. A., A simple method for perfusion of the fourth ventricle of the rat: studies on GABA release. *Br. J. Pharmac.*, 69 (1980), 323.

WEBSTER, R. A., (with Miller, A. A., Goff, D.), Predisposition of laboratory animals to epileptogenic activity of folic acid. *Folic Acid in Neurology, Psychiatry & Internal Medicine*, ed. M. I. Botez and E. H. Reynolds. New York: Raven Press, 1979, 331–4.

## PHYSIOLOGY

ALLEN, D. G., KURIHARA, S., Calcium transients at different muscle lengths in rat ventricular muscle. *J. Physiol.*, 292 (1979), 68–9P.

BANKS, B. E. C., (with Garman, A. J.), Structure-activity studies on bee venom polypeptides. *Toxicon*, 17 (1979) Suppl. 1, 5.

(with others), Apamin blocks certain neurotransmitter-induced increases in potassium permeability. *Nature*, 282 (1979), 415–7.

BANKS, B. E. C., CARSTAIRS, J. R., (with Chapman, C., Pearce, F. L., Vernon, C. A.), The preparation of nerve growth factor from the prostate of the guinea pig and isolation of immunogenically pure material from the mouse submandibular gland. *FEBS Letts.*, 105 (1979), 341–4.

BROWN, LUCY M., Urine dilution in man after drinking isotonic saline. *J. Physiol.*, 295 (1979), 103–4P.

CURTIN, NANCY A., WOLEDGE, ROGER C., Chemical change, production of tension and energy following stretch of active muscle of frog. *J. Physiol.*, 297 (1979), 539–50.

DAWSON, G. D., A Chequer-board stimulus generator for visual evoked potentials. *J. Physiol.*, 292 (1979) 6P.

DAWSON, M. J., WILKIE, D. R., (with Gadian, D. G.), Studies of the biochemistry of contracting muscle using $^{31}$p nuclear magnetic resonance ($^{31}$P NMR). *Cross Bridge Mechanism in muscle contraction*, ed. H. Sugi and G. H. Pollack. Univ. Tokyo Press, 1979, 515–37.

Studies of fatigue in intact anaerobic living muscle using $^{31}$P nuclear magnetic resonance ($^{31}$P NMR): Present results and future possibilities. *Lactate: Physiologic, Methodologic and Pathologic Approach*, ed. P. R. Moret, J. Weber, J.–Cl. Haissly and H. Denolin. Springer Verlag: Berlin, 1980.

Mechanical relaxation rate and metabolism studied in fatiguing muscle by phosphorus nuclear magnetic resonance. *J. Physiol.*, 299 (1980), 465–84.

DZIEGIELEWSKA, K. M., EVANS, C. A. N., MALINOWSKA, D. H., REYNOLDS, M. L., SAUNDERS, N. R., (with Møllgård, K.), Blood-cerebrospinal fluid transfer of plasma proteins during fetal development in the sheep. *J. Physiol.*, 300 (1980), 457–65.

DZIEGIELEWSKA, K. M., EVANS, C. A. N., MALINOWSKA, D. H., REYNOLDS, M. L., SAUNDERS, N. R., (with Møllgård, K., Reynolds, J. M.), Studies of the development of brain barrier systems to lipid insoluble molecules in fetal sheep. *J. Physiol.*, 292 (1979), 207–31.

DZIEGIELEWSKA, K. M., EVANS, C. A. N., MALINOWSKA, D. H., REYNOLDS, M. L., SAUNDERS, N. R., WILKINSON, S., (with Fossan, G., Lorscheider, F. L., Møllgård, K.), Proteins in cerebrospinal fluid and plasma of fetal sheep during development. *J. Physiol.*, 300 (1980) 441–55.

DZIEGIELEWSKA, K. M., SAUNDERS, N. R., (with Kocsis, G.), Identification of fetuin and other proteins in cerebrospinal fluid and plasma of fetal pigs during development. *Comp. Biochem. Physiol.*, 66B (1980), 535–41.

ELLAWAY, P. H., Recurrent inhibition of gamma motoneurones. *Neurosci. Letts.*, Suppl. 3, (1979), S 314.

ELLAWAY, P. H., FURNESS, P., MURPHY, P. R., Spindle and motor unit discharges correlated with the heart beat. *Neurosci. Letts.*, Suppl. 3, (1979), S 96.

ELLAWAY, P. H., MURPHY, P. R., Inhibition of gamma motoneurones by contraction of flexor digitorum longus and triceps surae in decerebrated, spinally transected cats. *J. Physiol.*, 292 (1979), 23–4P.

Autogenetic effects of muscle contraction on extensor gamma motoneurones in the cat. *Exp. Brain Res.*, 38 (1979), 305–12.

A quantitative comparison of recurrent inhibition of alpha and gamma motoneurones in the cat. *J. Physiol.*, 301 (1980), 55P.

ELLAWAY, P. H., MURPHY, P. R., TROTT, J. R., Autogenetic reflex effects of muscle contraction on gamma motoneurones. *Neurosci. Letts.*, Suppl. 3, (1979), 597.

FERENCZI, M. A., GOLDMAN, Y. E., SIMMONS, R. M., The relation between maximum shortening velocity and the magnesium adenosine triphosphate concentration in frog skinned muscle fibres. *J. Physiol.*, 292 (1979), 71–2P.

FITZGERALD, MARIA, The spread of sensitization of polymodal nociceptors in the rabbit from nearby injury and by antidromic nerve stimulation, *J. Physiol.*, 297 (1979), 207–16.

FITZGERALD, MARIA, BRUCE, LYNN, The weak excitation of some cutaneous receptors in cat and rabbits by synthetic substance P. *J. Physiol.*, 293 (1979), 66–7P.

FRASER, P. A., GARDNER-MEDWIN, A. R., MALINOWSKA, DANUTA H., Simple class apparatus for studying frog skin potentials. *J. Physiol.,* 292 (1979), 10–1P.

FRASER, P. A., (with Henderson, J. R.), The serial arrangement of endocrine and exocrine capillaries in the rabbit pancreas observed *in vivo. J. Physiol.,* 292 (1979), 2P.

GARDNER-MEDWIN, A. R., (with Coles, J. A., Tsacopoulos, M.), Etudes sur les mouvements du potassium à travers la membrane cytoplasmique des cellules gliales de la rétine. *Klin. Mbl. Augenheilk,* 176 (1980), 522–3.

(with Nicholson, C., Phillips, J. M.), Diffusion from an iontophoretic point source in the brain: role of tortuosity and volume fraction. *Brain Research,* 169 (1979), 580–4.

GARDNER-MEDWIN, A. R., GIBSON, JOSEPHINE L., WILLSHAW, D. J., The mechanism of potassium dispersal in brain tissue. *J. Physiol.,* 293 (1979), 37–8P.

GOLDMAN, Y. E., SIMMONS, R. M., A diffraction system for measuring muscle sarcomere length. *J. Physiol.,* 292 (1979), 5–6P.

GOLDMAN, Y. E., MATSUBARA, I., SIMMONS, R. M., Lateral filamentary spacing in frog skinned muscle fibres in the relaxed and rigor states. *J. Physiol.,* 295 (1979), 80–1P.

HARKNESS, R. D., Duration and lengths of foraging paths of *Cataglyphis Bicolor* (F.) (Hym., Formicidae). *Entomologist's Monthly Magazine,* 115 (1979).

Mechanical properties of connective tissues in relation to function. Fibrous Proteins: Scientific, industrial and medical aspects, Vol. 1, ed. D. A. D. Parry and L. K. Creamer. London: Academic Press, (1979), 207–230. *Proc. 4th International Conference of Fibrous Proteins,* Massey University, Palmerston North, New Zealand, Feb. 1979.

The speed of walking of *Cataglyphis bicolor* (F.), (Hym., Formicidae) *Entomologist's Monthly Magazine,* 114 (1979).

Transport of larvae of a beetle (Clytra atraphaxidis, Pall) by an ant *(Cataglyphis bicolor,* Fab.) *Zool. Anz. Jena,* 204 (1980) 3/4, S.

HUXLEY, A. F., The mechanical properties of cross-bridges and their relation to muscle contraction. *Proceedings of the International Union of Physiological Sciences, Vol. XIV,* Budapest 1980, 24.

Reflections on Muscle. *The Sherrington Lectures XIV (1977),* Liverpool University Press, 1980, pp ix + 111.

Future Prospects. *The Muscular Dystrophies. British Medical Bulletin,* Scientific Eds. J. N. Walton and F. L. Mastaglia, 36, 2 May 1980. 199–200.

IRVING, M., WOLEDGE, R. C., Dependence of shortening heat on distance shortened in frog skeletal muscle. *J. Physiol.,* 292 (1979), 76–7P.

IRVING, M., WOLEDGE, R. C., YAMADA, K., The heat produced by frog muscle in a series of contractions with shortening. *J. Physiol.,* 293, (1979), 103–18.

LIPPOLD, O. C. J., WILSON, C. G., The effect of cigarette smoking on finger tremor. *Br. J. Clin. Pharmacol.,* 6, 5 (1978), 457–8P.

LIPPOLD, O. C. J., WILLIAMS, E. J., WILSON, C. G., Finger Tremor and Cigarette Smoking. *Br. J. Clin. Pharmacol.,* 10, (1980), 83–6.

LYNN, B., Heat pain sensitivity of human skin after mild heat injury and its lack of dependence on the local blood flow. *Pain,* 8, (1980), 189–96.

MANN, G. E., SMAJE, L. H., (with Yudilevich, D. L.), Permeability of the fenestrated capillaries in the cat submandibular gland to lipid-insoluble molecules. *J. Physiol.,* 297 (1979), 335–54.

Transcapillary exchange in the cat salivary gland during secretion, bradykinin infusion and after chronic duct ligation. *J. Physiol.,* 297 (1979), 355–67.

MANN, G. E., SMAJE, L. H., (with Jones, Christopher J.), The role of cyclic nucleotides and related compounds in nerve-mediated vasodilatation in the cat submandibular gland. *Br. J. Pharmac.,* 68 (1980), 485–97.

NESS, A. R., The new Doctrine of Signatures. *Behavioural and Brain Sci. 2,* (1979), 303–4.

SAUNDERS, N. R., DZIEGIELEWSKA, K. M., Transcellular protein transfer in foetal and perinatal life. *Protein Transmission through Living Membranes,* ed. W. A. Hemmings, Elsevier: North Holland Biomedical Press, 1979, 333–47.

WOLEDGE, R. C., CURTIN, N. A., Problems of muscle energetics and some observations on the period after a stretch of active muscle. *Cross-bridge Mechanism in Muscle Contraction,* ed. H. Sugi and G. H. Pollack, Tokyo Univ. Press, 1979, 473–80.

[Publications of members of the Faculty of Clinical Sciences from April 1980 have not been included]

## *THE LIBRARY*

PERCIVAL, JANET, The Archives of the Peruvian Corporation: a handlist. London: University College London Library. Occasional Publications No. 7., 1980, 147 pp.

## *COMPUTER CENTRE*

DAY, A. C., Review of C. E. Hughes, C. P. Pfleeger, L. L. Rose, *Advanced Programming Techniques. Computer J.,* 22 (1979), 356.

Review of R. Yarmish and J. Yarmish, *Assembly Language Fundamentals, Computer J.,* 23 (1980), 164.

HORSBURGH, R. C. R., (with Gorinsky, B., Lindley, P. F., Moss, D. S., Parkar, M., Watson, J. L.), Evidence for the bilobal nature of diferic rabbit plasma transferrin. *Nature,* 5727 (1979), 157–8.

SAMET, P. A., The UCL Linked Mini-Computer System. *Managing the Distribution of DP,* Maidenhead, Infotech, 1979, 231–42.

(Ed.) EuroIFIP 79, *European Conf. on Applied Technology,* Amsterdam, New York, Oxford, North Holland, 1980, 754 pp.

(with Cluff, E. G.), Computers and the Cost of Privacy Laws. *Computers, Records and the Right to Privacy,* London, Input Two-Nine, 1979, 45–7.

# APPENDIX I

## NUMBERS OF STUDENTS 1979–80*

| | *Under-graduate* | | *Post-graduate* | | *Total* | |
|---|---|---|---|---|---|---|
| Faculty of Arts | 1,389 | (157) | 413 | (150) | 1,802 | (307) |
| Department of Political Economy | 301 | | 23 | (1) | 324 | (1) |
| Slade School of Fine Art | 115 | | 119 | (7) | 234 | (7) |
| | 1,805 | (157) | 555 | (158) | 2,360 | (315) |
| Faculty of Science | 1,384 | (3) | †563 | (131) | 1,947 | (134) |
| Faculty of Medical Sciences | 317 | (1) | — | | 317 | (1) |
| Faculty of Engineering | 446 | | 222 | (48) | 668 | (48) |
| Faculty of Laws | 304 | (10) | 167 | (46) | 471 | (56) |
| Faculty of Environmental Studies | 157 | (1) | 235 | (38) | 392 | (39) |
| | 4,413 | (172) | ϕ1,742 | (421) | 6,155 | (593) |

The figures in brackets indicate the number of part-time students included in the total under each head.

* As at 31 December 1979.

† This figure includes 90 full-time and 36 part-time students working in the College Faculty of Medical Sciences who were registered in the University Faculty of Science.

ϕ Of this number, 1,020 full-time and 397 part-time students were registered for higher degrees of the University of London; the remainder were working for higher diplomas of the University or of the College, or for the higher degrees of other Universities or were engaged in research work or attending postgraduate lecture courses.

Numbers of students at University College Hospital Medical School which joined the College on 1 April 1980 becoming the Faculty of Clinical Sciences were 487 (0) undergraduates and 37 (22) postgraduates.

# APPENDIX II

## UNIVERSITY FIRST DEGREE AND DIPLOMA AWARDS

## 1 OCTOBER 1979 – 30 SEPTEMBER 1980

### FACULTY OF ARTS

| B.A. Degree | *1st Class Honours* | *2nd Class Honours Upper Div.* | *2nd Class Honours Lower Div.* | *3rd Class Honours* | *Pass* | *Total* |
|---|---|---|---|---|---|---|
| Classics | 1 | 2 | 1 | – | – | 4 |
| English | 6 | 12 | 26 | 10 | – | 54 |
| Fine Art | 5 | 7 | 9 | 5 | – | 26 |
| French | 4 | 8 | 14 | 1 | – | 27 |
| Geography | 2 | 18 | 19 | – | 1 | 40 |
| German | 2 | 3 | 8 | – | – | 13 |
| Hebrew | 1 | – | – | – | – | 1 |
| History | 5 | 18 | 18 | 3 | – | 44 |
| History of Art | 1 | 11 | 4 | – | – | 16 |
| Italian | – | 4 | 3 | 2 | – | 9 |
| Latin | – | – | 2 | 1 | – | 3 |
| Linguistics | 2 | 6 | 3 | 1 | – | 12 |
| Medieval Archaeology | – | 5 | 1 | 2 | – | 8 |
| Modern Iberian & Latin American Regional Studies | – | 5 | 6 | – | – | 11 |
| Philosophy | 3 | 13 | 10 | 1 | – | 27 |
| Scandinavian Studies | – | 1 | 6 | 1 | – | 8 |
| Ancient History & Social Anthropology | 1 | – | 3 | – | – | 4 |
| Anthropology & Linguistics | – | 1 | 2 | – | – | 3 |
| English & History of Art | 1 | – | 3 | – | – | 4 |
| English & Linguistics | – | – | 1 | – | – | 1 |
| French & History of Art | 1 | – | 1 | – | – | 2 |
| French & Linguistics | – | 2 | 1 | – | – | 3 |
| German & Danish | – | – | – | 1 | – | 1 |
| German & History of Art | – | 1 | 1 | – | – | 2 |
| German & Linguistics | – | 1 | – | 1 | – | 2 |
| German & Norwegian | – | – | 1 | – | – | 1 |
| German & Swedish | – | 2 | 1 | 1 | 1 | 5 |
| Hebrew & Egyptian | 1 | – | – | – | – | 1 |
| History & History of Art | – | 5 | 2 | 1 | – | 8 |
| Italian & History of Art | – | 1 | 3 | – | – | 4 |
| Philosophy & Economics | – | 1 | 1 | – | – | 2 |
| | 36 | 127 | 150 | 31 | 2 | 346 |

| B.A. Degree (Aegrotat) | *Pass* | *Total* |
|---|---|---|
| | 3 | 3 |

## FACULTY OF LAWS

| LL.B. Degree | 1st Class Honours | 2nd Class Honours Upper Div. | 2nd Class Honours Lower Div. | 3rd Class Honours | Pass | Total |
|---|---|---|---|---|---|---|
| | 3 | 24 | 50 | 6 | 2 | 85 |

## FACULTY OF MEDICINE

Basic Medical Sciences and Pharmacology Examination: 126 Students passed.
Second Examination for Dental Degrees: 5 Students passed on re-entry.
M.B., B.S. Degrees: 104 Students passed, including 11 on re-entry.
B.D.S. Degree: 51 Students passed, including 10 on re-entry.

## FACULTY OF SCIENCE

| B.Sc. Degree | 1st Class Honours | 2nd Class Honours Upper Div. | 2nd Class Honours Lower Div. | 3rd Class Honours | Pass | Total |
|---|---|---|---|---|---|---|
| Anthropology | 1 | 12 | 5 | 5 | 1 | 24 |
| Applied Physics | 1 | 1 | 3 | 1 | 1 | 7 |
| Architecture | 5 | 15 | 12 | 8 | 2 | 42 |
| Astronomy | 1 | 1 | 4 | 6 | — | 12 |
| Astronomy & Physics | 1 | 2 | 5 | 5 | — | 13 |
| Biochemistry | — | 5 | 8 | 4 | — | 17 |
| Biology | — | — | 1 | — | — | 1 |
| Botany | 2 | 2 | 1 | 1 | — | 6 |
| Chemistry | 7 | 10 | 11 | 8 | 2 | 38 |
| Combined Biological Sciences | — | — | — | 1 | — | 1 |
| Computer Science | 1 | 1 | 2 | 2 | 2 | 8 |
| Computer Science with Electronic Engineering | — | — | 1 | — | 1 | 2 |
| Genetics & Botany | — | 1 | 2 | — | — | 3 |
| Genetics & Microbiology | — | — | 4 | 2 | — | 6 |
| Genetics & Zoology | — | 1 | 1 | — | — | 2 |
| Geography | — | 21 | 12 | 1 | — | 34 |
| Geology | 1 | 1 | 4 | 4 | — | 10 |
| Human Sciences | — | 3 | 6 | 1 | — | 10 |
| Mathematics | 4 | 6 | 11 | 4 | 1 | 26 |
| Mathematics & Physics | — | — | 3 | 1 | — | 4 |
| Medicinal Chemistry | — | 2 | 3 | — | — | 5 |
| Microbiology | 1 | 6 | 6 | 2 | 1 | 16 |
| Pharmacology | — | 4 | 3 | — | — | 7 |
| Physics | 6 | 3 | 4 | 4 | — | 17 |
| Physiology | 1 | 5 | 3 | — | — | 9 |
| Psychology | 5 | 20 | 28 | 2 | — | 55 |
| Statistics | — | 1 | 3 | — | 1 | 5 |
| Statistics & Computer Science | — | 2 | 2 | 2 | — | 6 |
| Zoology | 2 | 6 | 10 | 2 | 1 | 21 |
| | 39 | 131 | 158 | 66 | 13 | 407 |

| B.Sc. (Intercalated) Degree | 1st Class Honours | 2nd Class Honours Upper Div. | 2nd Class Honours Lower Div. | 3rd Class Honours | Pass | Total |
|---|---|---|---|---|---|---|
| Anatomy with Basic Medical Sciences | 2 | 2 | 2 | — | — | 6 |
| Biochemistry with Basic Medical Sciences | 1 | 2 | — | — | — | 3 |
| Biomedical Sciences | — | 8 | 5 | — | — | 13 |
| Immunology and Basic Medical Sciences | 1 | 1 | — | — | — | 2 |
| Basic Medical Sciences with Pharmacology | — | — | 1 | — | — | 1 |
| Pharmacology with Basic Medical Sciences | 1 | 5 | 1 | 1 | — | 8 |
| Basic Medical Sciences with Physiology | 1 | 3 | — | — | — | 4 |
| Physiology with Basic Medical Sciences | 1 | 3 | 1 | — | — | 5 |
| Psychology and Basic Medical Sciences | — | 7 | 2 | — | — | 9 |
| Sociology and Basic Medical Sciences | 1 | 2 | — | 1 | — | 4 |
| | 8 | 33 | 12 | 2 | — | 55 |

## FACULTY OF ENGINEERING

| B.Sc. (Engineering) Degree | 1st Class Honours | 2nd Class Honours Upper Div. | 2nd Class Honours Lower Div. | 3rd Class Honours | Pass | Total |
|---|---|---|---|---|---|---|
| Biochemical Engineering | 1 | 1 | 4 | — | 2 | 8 |
| Chemical Engineering | 4 | 13 | 6 | 1 | — | 24 |
| Civil Engineering | 6 | 13 | 9 | 4 | 3 | 35 |
| Electronic & Electrical Engineering | 5 | 7 | 6 | 6 | 5 | 29 |
| Electronic Engineering | 1 | — | — | — | — | 1 |
| with Computer Science | 1 | — | — | — | — | 1 |
| Mechanical Engineering | 2 | 2 | 3 | 2 | 2 | 11 |
| Naval Architecture | 3 | 3 | 1 | — | 1 | 8 |
| | 22 | 39 | 29 | 13 | 13 | 116 |

## FACULTY OF ECONOMICS

| B.Sc. (Economics) Degree | 1st Class Honours | 2nd Class Honours Upper Div. | 2nd Class Honours Lower Div. | 3rd Class Honours | Pass | Total |
|---|---|---|---|---|---|---|
| Economics | 2 | 19 | 17 | 9 | 4 | 51 |
| Economics & Economic History | — | 3 | 4 | 1 | — | 8 |
| Economics & Geography | — | 2 | 6 | — | — | 8 |
| Economics & Social Anthropology | — | 1 | 1 | — | — | 2 |
| Economics & Statistics | 1 | 3 | 1 | 2 | 1 | 8 |
| | 3 | 28 | 29 | 12 | 5 | 77 |

# APPENDIX III

## UNIVERSITY HIGHER DEGREE AND HIGHER DIPLOMA AWARDS

## 1 OCTOBER 1979 – 30 SEPTEMBER 1980

## FACULTY OF ARTS

D.Lit. Andrew George Watson. (1)

Ph.D. *English Language and Literature:* Thomas A. Braun, Cyril H. De Roo, Elizabeth James, Martin R. Orkin, David G. Tucker, Francis S. Whitehead. *Slade School of Fine Art:* Peter J. Baxter, Sheila M. Lattimore. *French Language and Literature:* Ruth H. Thomas. *History:* Keith J. Atton, Douglas Fermer, Christopher C. Hibben, Luis M. Ortega, Alexander R. Rumble. *History of Art:* Frances S. Borzello, Diana Naylor. *Philosophy:* Mohamad A. Ejeii, Risto H. Pitkänen. *Phonetics and Linguistics:* Nader Jahangiri, Mo-Shiet Tam. *Spanish and Latin American Studies:* David R. Brookshaw, Antoni M. Kapcia, Arthur J. Valender. (23)

M.Phil. *Bartlett School of Architecture and Planning:* Lynette E. Baker, Amanda J. Balson, Jacqueline A. Bennett, Alastair S. Bishop, Sheila C. Cassells, Martin G. Davey, Monica O. Fenesan, Zohreh Gharagozlu, David C. Girling, David A. Gleave, Mario D. Hair, Janet Keighley, Andrew M. Laing, Catherine R. Macaulay, Geoffrey K. D. Marsh, Ng Cheuk Hon, Stephen J. Palmer, Gillian A. Russell, Patrica A. M. Stacey, Merryl S. Wallace, Yuen S. O. Wong. *Egyptology:* Suzanne Lax. *English Language and Literature:* Robert H. Mace, Kathryn H. Southworth. *Philosophy:* Timothy L. Bateman, Ruth M. Crocket, Keith E. G. Simmons. *Phonetics and Linguistics:* Aicha Aouad-Elmentfakh, Gregory P. Smith. *Scandinavian Studies:* Simon B. Andrewes. (30)

M.A. *Archaeology:* Amy M. Buckli, Amy P. Dubois, *Keiko Kasahara, Victoria Mattocks, Sheila Raven, John A. Salkeld. *Architecture:* Tonis P. Tournazis. *Area Studies:* Reghbir K. Chhohan, Edison T. Furlani, Joao E. Gazzana, John W. Heseltine, Kathryn E. Holderness, Jorge A. Jara, Leonardo Leon Solis, Maria M. de Madariaga De Quijano, Raymond, M. McGuire, Henrietta C. E. Paget, Paul R. Russell, Sandra A. Segal, Frances M. Swaine, Christopher Taylor, Raphael Valentino Sobrinho, Tom J. Watts, Andres Yurjevic Marshall. *English:* *Winifred D. Abbott. *Library and Information Studies:* Susan P. Adler, Helen S. Ash, Peter R. Auber, Gillian H. E. Ayers, Susan J. Bament, Karen F. Barrett, Susan J. Brammer, Graham Bulpitt, Alan J. Currie, Ruth G. Davies, Ruth F. Finer, Patricia Foulkes, Barbara G. S. Hickford, Kay G. Holman, Mary E. Kempe, Katherine Kibbee, Richard B. Mellowes, Carol M. Mills, *Caroline A. Moore, Thomas S. Morgan, Ibrahim A. F. Musa, *Susan M. Pargeter, Susan E. Parker, Rosemary A. Raddon, Joanna H. Ramsey, Karen R. Riley, Helen M. Rodney, Noemi Rodriguez-Hernandez, Anahid Simonian-Kazarians, Robin A. B. Steedman, Andrew J. R. Taylor, Caroline J. Taylor, Peter J. Taylor, Richard M. Thompson, Janet Thorner, Anne P. J. Wilkin, Marasri Wongratana, Jennifer A. Wybourne. (63)

University Postgraduate Diplomas: Archive Studies 17, Fine Art 53, Linguistics 5.

*Awarded Mark of Distinction.

## FACULTY OF ECONOMICS

Ph.D. *Political Economy:* Jerzy Szroeter. (1)

M.Sc. *Economics:* Imad A. Abu Sa'ad. *International Relations:* Che Jung-Ung. (2)

## FACULTY OF LAWS

Ph.D. *Laws:* Jacqueline S. Cohen, Bayard Marin, Abdulai B. Timbo. (3)

LL.M. Olu A. Abanikanka, Joel Adler, Jeffrey Alvey, Raymond G. Andrews, *Belinda S. E. Ang, Mohamed S. Aziz, Philip W. Baker, Louise Baribeau, Bruce I. Benn, *Boey Lai Kuan, Lazhari Bouzid, Marcus R. Bowman, Russell P. Brown, *Richard J. Calnan, William M. Campbell, Stuart C. Carson, Charles M. Carvell, †Susie Cheung Sau Fun, Kevin S. H. Ching, Theofanis Christoforou, Bernard J. Devlin, Roger J. De Giorgio, Demetrius Eliopoulos, Keith B. Gallant, John A. Gibson, Micolaos Goutas, Ameze D. Guobadia, Robert D. Haynes, Abe Hazan, Steven Hazelwood, Patricia M. Hoverd, Hassan B. Jallow, Hussein A. Kaya, Mohamed T. Khanfri, Antonius Koutsofios, Salah Laribi, Lewis E. Levy, Richard G. Little, Hugh J. Livingstone, John C. London, Peter Luxton, Peter J. Martin, Nicholas Mavrokefalos, Mary M. McComish, Derrick V. McKoy, Theologos Michaelidis, Tanimola A. Molajo, John G. Mourgelas, John L. Newcombe, Atul Rajadhaksha, Alan J. Rycroft, Philip D. Sack, Janant C. Satpute, Hamida H. Sheikh, Peter D. Sinden, Eric C. Steinberg, Emmanuel Stephanakis, Nicolaas C. Steytler, Tan Siew Ching, Peter R. Taylor, Andreas Theophilou, Panayiotis Tsakanikas, Roger R. M. Wanless, Nicolas M. Wheatley, Jane M. Williams, Carol Wong Foong Keng, Peter Xuereb, Neophytos Xydas, Arifin B. Zakaria, Lawrence I. Zysman. (70)

University Postgraduate Diplomas: International Law 7, Shipping Law 16.

*Awarded Mark of Distinction.

†Awarded 78–79 but not included in the Annual Report for that year.

## FACULTY OF SCIENCE

Ph.D. *Anatomy and Embryology:* Juanita G. L. Burnby, Thomas M. Cocks, Rahima Crowe, Paul L. Debbage, Mario Aurelio Di Gregorio, Ng Mee Lian, Elizabeth M. Somerville. *Anthropology:* Angela R. H. Glatson, Peter W. Lucas, Stephen F. Rayner, Marc Schiltz. *Bartlett School of Architecture and Planning:* James M. Simmie, Martin S. Symes. *Biochemistry:* Tazoacha M. Asonganyi, Hon-Ki Cheng, John A. Fielder, Preminda Kessar, Ann H. Parker-Smith, Katherine A. Stygall, Colin R. Tillyer, Vassiliki Zongzas. *Botany and Microbiology:* Kahar-Deen O. Awonaike, Angela M. Deramo, Nighat Hafeez, Caroline L. Pankhurst, Alfred W. Rutherford, Deborah M. Thomson. *Chemistry:* Robert M. Aickin, Jehan A. Baban, Thomas W. Bell, Adrian Bury, Carey A. Chapman, Alan J. Crowe, Terry M. Gardiner, Zbigniew Kisiel, Jamil A. Khan, David R. S. Long, Vincent C. Ofuka Njar, Michael J. Osborne, Ian Poots, Roger Sutcliffe, Graham Walker, Jeremy N. Winter. *Computer Science:* Christopher J. Bennett, Clement H. C. Leung, George I. Pangalos. *Genetics and Biometry:* Abdulbari Bener, Geoffrey L. Daniels, Margaret J. Golding,

David P. Lovell. *Geography:* William S. Eyre, Nicholas E. G. Johnson, Paul Knott, Joy C. Williams. *Geology:* Fawzia M. A. Al-Ruwaih, Sarah Beeson, Peter J. Bigg. *History and Philosophy of Science:* Beverley C. Southgate. *Mathematics:* Paul E. Berry, Caroline F. M. Diver. *Pharmacology:* Jean E. Bradbury, Stephen J. Hopkins, David G. Trist. *Physics and Astronomy:* Stuart J. Arnold, Paul Barr, Rodney J. Blissett, Janet E. Drew, Vartkes Goetcherian, Malcolm Irving, Murtadha A. M. Khakoo, Shoib U. Khan, Claudio Mendoza, William P. O'Donnell, Graham L. Pearce, SachChidanand Sharma, David D. Walker. *Physiology:* Peter Furness, Mark G. Hibberd, Peter R. Murphy. *Psychology:* Ernest J. Hammond, Charles E. Johnson, Martin E. Le Voi, Analucia D. Schliemann. *Statistical Science:* Laurence A. Baxter, Ian B. J. Goudie. *Zoology and Comparative Anatomy:* Michael A. Boss, Philip G. Carey, Rui Cerqueira Silva, Christopher J. Duffin, John W. McCauley, Gesine Mohn, Mark W. Pettigrew, Michael J. H. Ratcliffe, Merilyn B. Wendon. (93)

M.Phil. *Anatomy and Embryology:* Elizabeth A. Messenger. *Anthropology:* Catrin S. Thomas. *Chemistry:* Arlene P. Schwab. *Genetics and Biometry:* Talat Jamil. *Physiology:* Jillian R. Hollingsworth. *Psychology:* Arthur D. Beaty, Gyorgy Gergely. *Zoology and Comparative Anatomy:* Fatemah M. Y. Abdul-Salam. (8)

M.Sc. *Architecture:* John Anastasiades, Chelvadurai Anjalendran, Yosr B. Bedran, David C. Blood, Clive Briffett, David J. Burney, Daniel J. Callaghan, George H. Clark, David L. Cobb, John R. Evans, Enrique Fuentes-Manzo, Thomas N. Fussell, Saad A. J. Ismail, Nilgun Komurcuoglu, Helen L. Macritchie, Suchar Manoharn, Brian Marland, John McKinney, David J. Poole, Daniel A. Sackey, Martin Schumacher, Mohamed Yi Shaddad, Geoffrey R. Shaw, Yasuko Shimizu, Nigel C. Smith, Olajide Solanke, Clifford C. Sparrowhawk, *Michael Young, Zee Mei Lin. *Biochemical Engineering:* Panagiotis Antonakopoulos, *Howard R. Delaney, Tajalli Keshavarz. *Biochemistry:* Virginia R. Bourgeois, Turgay Dartar, Jennifer L. Dean, Elizabeth H. Duker, Peter W. Kinyanjui, David K. Lidgett, Clara J. Mendoza de Falcon, Carl D. O'Connor, Jyoti Patel, Duncan R. Patterson, Ravigadevi Sambanthamurthi. *Computer Science:* Afshin Abderabbani, Richard C. Cattell, Chan Wing Yuan, Richard D. Clark, Yario H. Diamant, Paul Dudko, Elizabeth A. French, Georgina M. Howes, Angela Katsiyannis, Rosamund M. Rawlings, Paul Robinson, Hossein Sobati, Ta Dang Khoa. *Conservation:* John G. Allan, David R. Blatchford, Penelope M. Evans, Pamela M. Gilder, Jean L. Rowland, Donna B. Smith, Rosemary A. Teverson, John C. Tyler. *Educational Psychology:* Ruth G. Birnbaum, Jane S. Blewett, Paula A. Gregor, Alan Jensen, Alastair S. King, Sarah Morris, Julia Powell, Peter Tam Wing Kwui. *History and Philosophy of Science:* Azizan Baharuddin, Syed N. Haq, James G. O'Brien, Lawrence D. Pedersen, David J. Smith, Michael J. Wilmott. *Hydrogeology:* Susan C. Bull, Hugo M. Cabrera Palacios, Michael C. Cook, Njoku Igodu, Abubakarr A. W. Jalloh, Esmail Khazai, Reginald T. Lewis, Valerie A. Lowings, Charles K. Malinda, Wolfgang H. Raab, Luis A. Ramirez Leon, Imelda A. Richardson, Mahan Singh, Richard J. Yelf. *Information Science:* *Susan R. Suart. *Marine Earth Science:* Edward B. Cooper, Trevor Davidson, Samuel W. Murphy III, James K. Nicholls, Helen Y. Orton, Ian N. Tomlinson, Colin L. Williams. *Micropalaeontology:* David G. Clark, Christopher P. Dewey, George F. Forsey, Magdy H. Guirguis, Nicholas A. Holmes, Roy M. Irvine, Ho Y. Lee, Se-Moon Park, Andrew T. Riddick, Alastair R. Thomson, Julian M. Wade. *Neurological Science:* Pratibha J. Doshi. *Physiology:* Clyde C. Daly, Robert B. Moore,

Eme E. Osim, Sara B. Uchitel. *Statistics:* Terence D. Agbeyegbe, Richard B. Gathercole, Brian Gedalla, *Oliver N. Keene, *Peter B. Key, *Julie A. Morris, Susan M. Morrissey, John M. B. Moss, Sivagnanasunderam Ravendran, Hilary A. Rickard, Philip J. Sloper, Wu Wen Chee. (128)

University Postgraduate Diplomas: Computer Management Studies, 7, Material Culture 1*.

*Awarded Mark of Distinction.

## FACULTY OF ENGINEERING

D.Sc. Jeffrey Lewins. (1)

Ph.D. *Chemical and Biochemical Engineering:* Neville M. Fish, Jean-Yves R. D. Gregoire, Francis O. Olatunji, Peter G. Smith, Bijan Vakilzadeh. *Civil and Municipal Engineering:* Thomas A. Harrison, Richard R. Simons, Andrew J. Wishart. *Electronic and Electrical Engineering:* Paul Barton, Michael C. Bone, Geoffrey H. L. Childs, Trevor James Hall, Dariush Mirshekar-Syahkal, Timothy J. Moulsley, Martin R. Sach, Alwyn J. Seeds, U Htoo. *Mechanical Engineering:* Nikolas E. Mikelis. (18)

M.Phil. *Electronic and Electrical Engineering:* Odysseas C. Economides, Mohamed S. M. Moawad. (2)

M.Sc. *Biochemical Engineering:* Charles A. de Freitas, David R. Gray, Nicolas A. Higgins, Avra M. J. Houston, Helen Koutsou, *Paul A. Sinclair, *John C. Turner. *Ergonomics:* Paula J. Mills, Rodney D. Owens. *Marine Engineering:* Roger C. Baker, John R. Chapman, Paul S. Claridge, Charles M. Kinnell, Peter G. Luff, John H. Moore, Charles J. Pearson, Keith Raybould, John A. Shepherd, Christopher D. Trout. *Microwaves and Modern Optics:* Constantine Aidinis, Salah Al-Chalabi, Nicholas Apostolou, Jaspal S. Bharj, Charles E. Bryan, Janet Burt, Duncan G. D. Clark, Demos Demosthenous, *Ian P. Giles, Frank Grunfeld, Manjeet S. Ner, Andrew C. Protopapas, Savvas P. Savva, Evangelos E. Voglis, John Ziras-Christodoulopoulos. *Naval Architecture:* Abd E. R. Aly El Sayed, Michael D. Challoner, David C. Fellows, James D. M. Forbes, (John C. Keast, *Robert A. W. Mines, *Trevor B. Rutling, Ossama Y. Y. Shoula, Robin P. Smith, David R. Tozer, Balasubramanian Varadarajan, Munir Wahid, Gary N. Wiseman. *Ocean Engineering:* Martin L. Goodman, James H. Martin, John R. Potter, Allan Sathyadev, *Peter J. Stock. *Photogrammetry:* *Silburn St A. Clarke, Timothy C. Jackson, Manoj R. Shab. *Surveying:* Nigel Atkinson, Jeffrey Auty, Bruce D. Beadle, Mohamed S. M. El Hosseny, Elaine O. Kimberley, Lee Kam Fatt. (61)

*Awarded Mark of Distinction.

## FACULTY OF MEDICINE

Ph.D. *Anatomy and Embryology:* Ian E. Barnes. *Zoology and Comparative Anatomy:* James N. Woody. (2)

# APPENDIX IV

## COLLEGE DIPLOMA AND CERTIFICATE AWARDS

## 1 OCTOBER 1979 – 30 SEPTEMBER 1980

### FACULTY OF ARTS

*Certificate in Archive Administration:* Sui Gim Chua, Elizabeth Ann Williams. (2)

*Diploma in Library and Information Studies:* Thomas Jeremy Dyke Acland, Geoffrey Michael Bothamley, Jane Alison Buxton, Irene Campbell, Carmen Lee Kar Man, Michael Ian Chisholm, *Catherine Marie Cooke, Helena Magdalen Torre Coope, Terence John Corbett, Sandra Cromey, Thomas Robin Du Boulay, Timothy Michael Egan, Sarah Anne Falla, Linda Joyce Fisher, Ruth Amanda Goldstein, Katherine Ruth Gommon, Peter John Guilding, *Richard Guy Heseltine, Susan Jane Hubbard, Anne Johnston, Patricia Killiard, Thalia Knight, Rita Mary Laughton, *Deborah Marion Love, Carole Phyllis Medland, Anne Okwisa Omutere, Greham Leslie Organ, Andrew Alan Orgill, Janet Elizabeth Osborne, John Stephen Poole, Caroline Potter, Jacqueline Hilda Carol Quamina, Jeremy Donald Rosie, Soudabeh Samii, Catherine Diana Sargeant, Tessa Elizabeth Sholl, Daphne Silvester, Carol Ann Smith, Eileen Sproates, Julie Helen Strachan, Ann Howell Sutcliff, Audrey May Taylor, Carol Elisabeth Tormey, Cathryn Julie Townsend, Susan Mary Tuckwell, Daniela Vuolu, Elizabeth Rachel Webb, Elizabeth Ann Wells, John Antony Whitehead, Jenifer Wilkinson. (50)

*Certificate of Proficiency in Phonetics:* Karuna Ashoka, Maria Silvia Acuna Vedoya, Catherine Attwood, Carol Lyn Boughtflower, Susan Jane Carr, Carolyn Elizabeth Cooper, Eufrasia De La Fuente, Giulia Gardinazzi, Kimitaka Hara, Hiroya Iwamoto, Ann Teresa Kelly, Susan Margaret Kohnstam, Peter Ulrich Kopper, Michael Machin, Ahmed Mostefai, Pedro Enrique Osses, Teresa Perez Camboa, Gunnel Regina Elizabet Persson, Sabine Philippeit, Elia Rakotomalala, Shelagh Rixon, Susana Noemi Rozzi, Maria Eugenia Salas Villar, Gustavo Francisco San Roman, Anne-Marie Martine Smith, Catherine Spillane, Beverley Collette Starkey, Jill Taylor, Mara Thorne Kayoko Wada. (30)

*Certificate in Social Research (Developing Countries):* Hairi Bin Abdullah, Timothy Ojukere Alabi, Hamdan Al-Ssoraihy, Rajendra Prakash Bansal, Mehendra Nath Bora, Paul Philip Buffard, Abd El-Latif Abd El-Mageid El-Heneidy, Kaushalya Idnani, Satish Kumar, Bishan Kumar Malbotra, Shah Mohammad Murshid, *Narendra Gopal Nag, †Olupero Gbemisola Odumuye, Mulkh Raj, Athur Ramakrishnan Ranganathan, Nasrullah Atish Sheikh, Farid Ebraheem Sheerah, E. P. Altakoya Thangal, Lina Capellan Valencia, Brij Mohan Vohra. (20)

* Awarded with distinction
† Awarded with merit

### FACULTY OF SCIENCE

*Diploma in Conservation:* John Grant Allan, Roy McNaughton Birch, David Robert Blatchford, Penelope Mary Evans, Pamela Margaret Gilder, Michael James Jackson, Susan Wayne McIntyre, Jean Lesley Rowland, Mary Elizabeth Scruby, Donna Barbara Smith, Rosemary Anne Teverson, John Clarke Tyler. (12)

*Diploma in Hydrogeology:* Susan Carole Bull, Hugo Marcelo Cabrera Palacios, Tesfaye Chernet, Michael Clive Cook, Njoku Igodo, Abubakarr Amadu Wurie Jalloh, Reginald Timothy Lewis, Valerie Anne Lowings, Charles Kasyoka Malinda, Wolfgang Hermann Raab, Luis Alfonso Ramirez Leon, Imelda Anne Richardson, Mahan Singh, Richard Jack Yelf. (14)

## FACULTY OF ENGINEERING

*Diploma in Biochemical Engineering:* Panagiotis Antonakopoulos, Charles Alfred de Freitas, *Howard Ronald Delaney, David Richard Gray, Nicolas Andrew Higgins, Avra Miki Joakim Houston, Tajalli Keshavarz, Helen Koutsou, *Paul Andrew Sinclair, *John Christopher Turner. (10)

*Diploma in Chemical Engineering:* Richard Frederick Barton, Sotirios Stavrakos, Mark Rockwell Welford, Nicholas James White. (4)

*Diploma in Marine Engineering:* John Robert Chapman, Peter Graham Luff, John Howard Moore, Charles John Pearson, John Andrew Shepherd, Christopher David Trout. (6)

*Diploma in Microwave Engineering:* Constantine Aidinis, Emmanuel Agbor Akat, Salah Al-Chalabi, Nicholas Apostolou, Jaspal Singh Bharj, Charles Edward Bryan, Janet Burt, Chua Yok Lee, Duncan George Derwent Clark, Demos Demosthenous, Graham Peter Dennis Fox, *Ian Peter Giles, Frank Grunfeld, Brendan John Peter Knowles, Tadeusz Miroslaw Kubiak, Fakhereh Mirrashed, Manjeet Singh Ner, Andrew Costas Protopapas, Savvas Panayoti Savva, Evangelos Elias Voglis, John Ziras-Christodoulopoulos. (21)

*Diploma in Naval Architecture:* Abdelrazzak Reda Aly El Sayed, Michael David Challoner, David Charles Fellows, James Dougal Menzies Forbes, *John Christopher Keast, *Robert Anthony Wilton Mines, *Trevor Barmby Ruting, Ossama Youssif Youssif Shoula, Robin Peter Smith, David Robert Tozer, Balasubramanian Varadarajan, Munir Wahid, Gary Norman Wiseman. (13)

*Diploma in Ocean Engineering:* Martin Lawrence Goodman, James Henry Martin, John Richard Potter, Allan Sathyadev, *Peter John Stock. (5)

*Diploma in Photogrammetry:* Samuel Ndubuisi Agwor, Boniface Chukwukelu Anidobi, *Richard Alan Baldwin, *Richard Derek Chilton Bevis, Adeola Adebimeji Ofolabi Jolaoso, Adetunji Ayodele Olaniyi, Usman Kehinde Kunle Quadri, Peter Charles Malaba Wakoli. (8)

*Diploma in Surveying:* Olawepo Johnson Adeniyi, Llinos Davies, *Hilary Elizabeth Faull, Anthea Jane Lyle, *Ian Webster Slade, Neil Edward Vancans. (6)

* Awarded with distinction

## FACULTY OF ENVIRONMENTAL STUDIES

*Diploma in Architecture:* Mark Alexander Noel Baigent, Sally Catherine Bland, Matthew Borowiecki, William Charles Chandler, Sarah Louise Curl, Malcolm John Dixon, Andrew Stuart Douglas, Alexandra Elizabeth Freemantle, Kathleen Gal, Penelope Hazel Mary Garnham Wright, Aina Christina Grayson, Michael Duane Hund, Lucille Lim, Gordon John Maclaren, Brigitte Maurice, Michael John Montuschi, Alison Bianca Newsome, Michael Antony Pope, Susan Jane Reed, Ewa Slabik, Martin Touska, Miloslav Vancura, Paul William David Way. (23)

*Certificate in Development Planning:* Musa Dawoud Abdo, Haji Abdul Majid Abdu Malek, Daud Ahmad, Ishtiaq Ahmad, Daher Alhajjaj, Tongpang Ao, Mamdouh Ahmad Armouti, Maria Cristina Arriaga-Salinas, Naz-Pari Azarm, Esam Hekmat Mohammed Balbisi, Mohammad Khir Nazir Balqar, Ismail Salah Bazian, Poonwilai Chantrathada, Malojirao Chavan, Ved Parkash Chetal, Young Chull Choi, Dina Abdulla Dabbas, Sudhansu Kumar Dasgupta, Mario Patricio Durandeau, Sham Sarup Dutta, Munther Anwar Farid, Joao Alfredo Sampaio De Figueiredo, Halim Bin Haron, Robethoh Hashim, Kamarul Bahrim Hj Abdul Raof, Erturk Isikpinar, Nasrul Islam, Deep Chand Jain, Rafiq Ahmad Jilani, Lalit Kumar Joshi, Mariam Kawash, Wan Mohamad Bin Hj Wan Konok, Malinee Kulvanich, David Thau Phin Lee, Macdonald Esau Longwe, Kewal Krishan Madan, Rampura Malaye Gowda Malaviah, Mazen Husni Malhas, David L. Mshila, Bock Tye Ng, David Khothatso Nthongoa, Ananda Raj Pant, Jawahar Parashar, Georges J. Phedonos, Ved Prakash, Narin Sakulcalanuwat, Krishna Kumar Suxena, Ali Nasir Sheikh, Sarah Nyemada Sherman, Johan Silas, Christie Silva, Charles Brian Slogrove, Salwa Ibrahim Snobar, Noor Sharipah Sultan Sidi, Prasert Trakulwongse, Nirach Vajanpoom, Kenneth Anthony Edgar Van Der Spuy, Abdul Wakil. (58)

*Diploma in Davelopment Planning:* Mahmoud Ibrahim Abdalla, Wasif Ali Khan, Ghaffar Amali Khameneh, Marilyn Jean Andrews, Marie Fe L Apacible, Gloria Christina Barrios Cader, Hassan Alla' Al-Din Bedri, Maria Mercedes Benites Machado, Madhaba Bahadur Bista, Oscar Enrique Bracho Malpica, Data Ibifuro Briggs, Luis Rafael Bustillos Ravago, Mahendra Nath Chatterji, Adela Chavarria Gonzalez, Nanji Bhanji Chhadua, Fambai Emmanuel Chimbindi, Marina Antoinette Geetha Cooray, Ignez Castro Lopes Do Couto, Jorge Cotera Mira, Thamrong Daungpatra, Glynn Brian Davies, Anastaina Davila, Maritza Davila, J. E. De Antunano Maurer, Pavlos Marinos Di Andrea Deladetsimas, Ivonne C. Dowing La Riva, Massoud Ebrahim, El-Mahdi El-Hussein El-Hussein, Antonius Estamo, Carlos Jose Faillace Carreno, Hector Jorge Fierro Balbontin, Luiz Carlos Valdes Flores, Claudio Martins Gaiarsa, Andrew Braidwood Gibbon, Peter Morlai Gibrilla, Gloria Wang Wong, Ivan Enrique Gomez Valencia, Jose Luis Gonzalez Uribe, Jorge Humberto Guerrero Plaza, Nidia Gutierrez Carmona, Wisam Hakim, Mohsen Hassan, Juan Enrique Harnandez, Mohamed El Hadi Hussein Gaafar, Ali Ismail Kanli, Mohamad Karkouch, Sylvia Marie Keera, Fatma Aly Khafagy, Muhammad Nuruzzaman Khan, Cornelious Goja Lado Kulang Ali, Hiroyoshi Kurihara, Lam Kar Keong, Sok Mook Lee, Helia Ines de Fatima Lopez Zarzosa, Arturo David Lujan Anchondo, Subhas Majumdar, Hugo Isaac Maldonado, Maria de Jesus Medina Alvarez, Alfredo Ramon Michelena Rodriguez, Thet Mon Min, Aung Kyaw Minn, Marguerite Louise Misteli, Sergio Morales Morales, Farokh Moshiri, Charles Muganzi Amoti, Lucia Munoz Gonzalez, Edgard Enrique Niemtschik Liscano, Yolanda Ester Leonor Nigro Escobar, David Dixon Nokrach-Chermoy, Salah Eltayeb Obeidalla, Francis Ogundare, David Oloruntoba Olanreqaju, Halifax Amosa Oppong, Ashley Lionel Salvadore Perera, Maria Teresa Pizarro Sanchez, Auristela Prato Serrano, Christopher Alan Radford, Alfonso Gilberto Rengifo Aguirre, Restituto Roxas, Rolf Ruge Moya, Mohamed Abdalazez Saad Yeser, Nabil Safwat, Claudio Salvador Sanchez Schultze, David Edward Francis Satterthwaite, Piyanan Sawadsingkarn, Michael Willibald Schmitz, Martin Georg Schumer, Blasi Apolinari Seleki, Dron Prasad Shrestha, Hana Meilina Soetoyo, Luis Soto Leiva, Anthony George Sozi, Abimanyu Takdir Alamsyah, Leonardo Alvarez Tanseco, Redda Berhane Tewelde, Nellie Marie Tiendas, Mahir Abdul Ahad Towfiq, Tulio Gerardo Urdaneta Rangel, Anamaria Valdez Luengo, Fabio Villegas Ramirez, Heinrich Wieseler, Colin Witcliffe Wright, Ahmad Yazdanparast. (103)

# APPENDIX V

## SCHOLARSHIPS, STUDENTSHIPS AND PRIZES
## COLLEGE AND UNIVERSITY AWARDS

### COLLEGE AWARDS

*Charlotte Ashby Prize (Laws)*—Sharon McLoughlin.
*Barlow Prize (Electronic and Electrical Engineering)*—T. J. Moulsley.
*Herbert Henry Bartlett Scholarships (Architecture)*—Caroline Maudnit, P. St John.
*Herbert Batsford Prize (Architecture)*—Andrea J. Taylor.
*Thomas Witherden Batt Scholarships (Science)*—L. K. Lih, N. E. Fuller, I. Tidd, K. Butler.
*Leonard Bayliss Memorial Prize (Physiology)*—Neela Kotecha.
*Bayliss-Starling Memorial Scholarship (Psychology)*—Susan F. Gottlieb.
*Francis Perch Bedford Prize (Zoology)*—J. Allan.
*Benington Memorial Studentship (Anthropometry)*—F. McCloghry.
*Ada Heather Bigg Prize (Political Economy)*—M. Thompson.
*Boise Scholarships (Fine Art)*—Christine Hatt, Teffany Osborne, Rita Smith, D. Haughton, E. Williams, Veronic Ryan, P. Turton.
*Bonney Prize (Geology)*—D. V. Pearse.
*R. E. Bradbury Memorial Prize (Anthropology)*—Georgina Born.
*Broderick-Parry Prize (Geography)*—R. M. Legg.
*'Building' Prize (Environmental Studies)*—Maria Vassiliadou, D. J. M. Shabetal, B. G. Turner, prize equally divided.
*Chadwick Certificate and Prize (Civil Engineering)*—H. W. Li.
*Churchill-Jenkinson Prize (Archive Studies)*—S. K. C. Palmer.
*Antonio Cippico Medal and Prize*—Giulia Gardinazzi.
*Lillian Clarke Prize (Botany and Microbiology)*—Michelle Jones.
*Clinton Prize (Electrical Engineering)*—I. J. Cox.
*Cowley Prizes (Library and Information Studies)*—S. M. Pargeter, C. A. Moore.
*Croxon Memorial Scholarships (Clinical Sciences)*—A. D. Gordon-Brown, A. A. Khakoo, L. A. Loizou, C. E. Murphy, V. G. Patel, K. J. Cochran, A. Maden.
*Dawes Hicks Postgraduate Scholarship (Philosophy)*—A. J. Newman.
*Deans Scholarship (Electronic and Electrical Engineering)*—D. G. Uttam.
*Donaldson Medal (Architecture)*—M. S. Hacker.
*Early English Text Society's Prize*—Halina Sand.
*Elliot-Blake Studentships*—P. L. J. Baluk, Felicity Z. Watts, I. Todd, Jane Moores.
*Environmental Design Prize*—Christina Wolff.
*Douglas and Anne Feltham Scholarships (Clinical Sciences)*—A. E. Potter, E. M. Sassoon, J. del Castillo, T. C. Lee, M. L. Glaber, G. M. Jones.
*Fielden Research Scholarship (German)*—R. Vale.
*Sir Bannister Fletcher Prize and Medal (Architecture)*—Maria Vassiliadou.
*Flinders Petrie Scholarships in Egyptian Archaeology*—Robyn Gilliam, Laverne Schnare, A. El-Khouli.
*Daryll Forde Award (Anthropology)*—Joanna Verrall.
*Foreign Student Scholarship in Arts*—Liliane Haegeman, Sara Ameri.
*Edith Goodyear Prize (Geology)*—S. W. N. Hawkins.
*Eleanor Grove Scholarships for Women Students (German)*—Claire Cohen, Karen MacDonald.
*Eva Grunwald Memorial Prize (French)*—Jill Hutchence, Jill Turner, prize equally divided.
*Paul Hass Studentship (Biochemistry)*—P. S. N. Rowe.

*Violet Hall Prize (French)*—M. Machin, J. Bracher.
*Hart Prize (Photogrammetry)*—R. A. Baldwin.
*Hart Prize (Surveying)*—Hilary E. Faull.
*Archibald P. Head Memorial Medal and Prize (Mechanical Engineering)*—H. Iacovides.
*Heinmann Medal (German)*—Mary J. Jackson.
*Elsie Hitchcock Prize (English)*—Jenny Wright.
*John Oliver Hobbes Memorial Scholarship in Modern English Literature*—S. Roberts.
*Hotine Exhibition (Photogrammetry and Surveying)*—Anthea J. Lyle.
*R. B. Hounsfield Scholarships in Traffic Engineering*—J. C. Golias, B. G. Heydecker.
*R. B. Hounsfield Prize in Traffic Engineering*—F. J. Valero.
*Joseph Hume Scholarship in Law*—Susan C. Carpenter.
*Huntingdon Research Centre Prize (Histology Part I – Medical Sciences)*—Hilary A. Wyatt.
*Hurst Prize in English Law*—Liatalino Siabkin.
*Institution of Civil Engineers Prize*—N. R. Patel.
*Institution of Electrical Engineers Prize*—N. Karavassilis.
*Institution of Mechanical Engineers Prize*—A. J. Keane.
*Jackson Lewis Scholarships*—P. Makenna, Lorna Oakes, Faxilet Vardar, Rosaly Lopes.
*Sir Hilary Jenkinson Scholarship in Archive Studies*—M. R. Foster, J. M. Senior.
*Jolowicz Prize (Roman Law)*—Joanne Prosser.
*Ker Memorial Prize (English)*—S. Howard.
*Kitson Prize (Chemical and Biochemical Engineering)*—E. D. A. Obeng.
*Dr R. Kohn Prize (Physiology Part I – Medical Sciences)*—S. C. Mital.
*Library and Information Studies Exhibitions*—R. Osmond, M. McClure.
*Sir John MacAlister Medal (Library and Information Studies)*—R. G. Heseltine.
*John Marshall Prize and Medal (Philology)*—D. Katz.
*Maxwell Law Prize*—Stella Outen.
*Medical Sciences Bursaries Fund Scholarship*—Diana R. Holdright.
*Merck Sharp and Dohme Limited Prize (Biochemistry Part I – Medical Sciences)*—M. N. Upton.
*Merck Sharp and Dohme Limited Prize (Genetics Part II – Medical Sciences)*—Diana R. Holdright.
*Sir William Meyer Prize (Geography)*—Anne E. Green.
*Sir William Meyer Essay Prize (Geography)*—Ruth C. Sawtell.
*Sir William Meyer Prize (History)*—E. Green, Jenny Hughes, highly commended.
*Sir William Meyer Travelling Studentships (History)*—D. Bateson, G. Durcan, Caroline Jackson, C. Jarman, Susan Forsdick, Karen Liebreich, J. Robson, R. Sweet.
*John Stuart Mill Scholarship in Philosophy of Mind and Logic*—A. J. Newman.
*Momber Scholarship in Science*—A. Finlay.
*Cecily de Monchaux Memorial Prize (Psychology)*—Julia Marsh.
*Rosa Morison Postgraduate Scholarship in Arts*—M. A. Cheetham.
*Morley Medal and Prize (Modern English Literature)*—N. Rennie.
*Morris Prize (Geology)*—A. R. Driscole.
*Owings Travelling Scholarship (Environmental Studies)*—A. Hale, Helen Heslop.
*Perren Studentship (Astronomy)*—I. Howarth.
*Platt Prizes (Greek)*—Philomena Harrison, Amanda Cater, Caroline Affer.
*Harry Poole Prize (Chemistry)*—Anne P. Davies.
*Graham Robertson Travelling Scholarships (Fine Art)*—I. Robertson, M. Cullerne-Bown, Teresa Lawler, Merryl Harrison.
*Mayer de Rothschild Scholarship in Pure Mathematics*—A. Onac.
*Schafer Prize in Physiology*—N. R. Saunders.
*Hugh Smith Memorial Prize (English)*—J. A. Clarke.
*Smith Kline and French Laboratories Limited Prize (Medical Sciences)*—J. A. Lee.
*Stevenson Prize (Applied Mathematics)*—D. T. Papageorghiou.

*Sully Scholarship (Psychology)*—G. Gergely.
*Sir Andrew Taylor Prize in Architecture*—W. Wang.
*Troughton Scholarship*—I. Haywood.
*Tuffnell Scholarship (Chemistry)*—Yau-Tai Lam, Kathleen A. Johnson.
*A. J. V. Underwood Exhibition (Chemical and Biochemical Engineering)*—C. M. Chapman.
*L. F. Vernon-Harcourt Prize (Civil Engineering)*—A. F. Leung.
*Ellen Watson Memorial Scholarship in Applied Mathematics*—Diane S. Lord.
*Webber Prize (Laws)*—Diane Springthorpe.
*Dr Christopher Whiteside Award (Clinical Sciences)*—Elaine Sassoon.
*Dr D. T. Whittet Prize (Pharmacology Part II — Medical Sciences)*—Elizabeth J. Evanson.

## FACULTY MEDALS AND PRIZES

*Engineering: Goldsmid Medal and Prize*—A. F. Leung.
*Environmental Studies: Medal and Prize*—P. St John.
*Laws: Andrews Medal and Prize*—Stella Outen.
*Medical Sciences: Medal and Prize*—L. Loizou.
*Science: Medal and Prize*—Ann P. Davies.

## SESSIONAL PRIZES

*Anthropology: Kaberry Prize*—Mary M. Mair, R. Keenoy. *Rosa Morison Prize*—Joanna Head, G. Stanton. *M. G. Smith Prize*—Isabella K. Shanks, W. B. Garber, equally divided.
*English: Campbell Clarke Scholarship*—Victoria Feaver, Emmeline Johnstone. *West Scholarship*—P. S. Milican. *Ifor Evans Prize*—Lisa C. Baxter.
*French: Rosa Morison Prizes*—Susan Austin, Tessa Kendall, Patricia Payn.
*Geography: College Prize*—R. S. Mulle. *H. C. Darby Prize*—D. J. Blow. *Maconochie Prize*—C. C. Hand. *1903 Prize*—Sarah J. Whatmore. *Sessional Prize*—Patricia A. Davies, J. B. Barradell, equally divided.
*German: Robertson Prize*—Rosemary Harrison. *Willoughby Prize*—S. N. Rainbird.
*Greek: Long Prize*—Anna M. Cohen.
*History: Alfred Cobban Prize*—H. Greave, K. Shanks, equally divided. *Dolley Prize*—D. Patterson. *Pollard Prize*—K. Buchanan, M. Le Jeune, equally divided. *West Prize*—Sharman Kadish.
*History of Art:* Combrich Prize—M. Pinney. *Whittkover Prize*—Susan Ashworth.
*Italian: Sir Anthony Panizzi Prize*—Ann Kelly.
*Latin: Key Prize*—P. M. Jones.
*Philosophy: Dawes Hicks Scholarship*—(1) Dorothy Stein, G. Ostrolenk. *A. J. Ayer Prize*—D. Thomas.
*Phonetics and Linguistics: Harold E. Palmer Prize*—D. Peacock. *Alexander Melville Bell Prize*—Susan E. Coe.
*Political Economy: Hune-Lloyd Scholarships*—(1) C. A. Hopkins, (2) R. S. Mully, (3) J. J. Han. *G. C. Allen Prize*—A. S. Economides.
*Scandinavian Studies: Rosa Morison Prize*—Adriana Alexander, (2) D. Spade, equally divided. *Crabtree Prize*—N. Musk.
*Spanish and Latin American Studies: Alcala Galiano Prize*—Denise Jenkin. *Sessional Prize*—M. A. Soriano Alvarez.
*Laws: Andrews Prizes*—Elizabeth Walters, A. Porter, J. Burkhill, Gail Jaffe, Finola O'Byrne.

*Architecture: Brtlett Prizes*—(1) J. R. Pile, (2) Kathryn Piotrovska, (3) G. C. Comely, (4) R. G. Wood.

*Anatomy and Embryology: J. Z. Young Prize*—(1) Celia Gibb, (2) Janet Mundy, equally divided. *N. A. Barnicot Prize*—(1) Joanna Lotus, (2) Jane Walker, equally divided.

*Biochemistry: Jack Drummond Prize*—M. Hall. *Plimmer Prixe*—A. J. Wilkinson.

*Botany and Microbiology: Robert Hooke Prize*—Geeti Rao. *Huxley Prize in Biology*—P. V. Morton.

*Chemistry: C. K. Ingold Prizes*—(1) G. P. Proud, (2) I. Robins, (3) Annettee J. Travis, (4) M. L. Wolf.

*Computer Science: Sessional Prize*—(1) R. J. Beatson, (2) P. A. Tabor.

*Geology: Hollingworth Prize*—T. R. Charton, (2) R. G. Perry, equally divided.

*Mathematics: Filon Prize*—M. Loucaides. *Hill Prize*—M. C. W. Jones. *Jeffery Prize*—T. C. Price.

*Pharmacology: H. O. Schild Prize*—C. D. Owen.

*Physics and Astronomy: William Bragg Prize*—T. N. Buscher. *Oliver Lodge Prize*—P. J. Valdes. *Wood Prize*—N. D. Lloyd. *Huggins Prize*—D. A. Bone.

*Physiology: Sanderson Prize*—Sarah J. Davies, (2) C. B. Prior, equally divided.

*Psychology: Burt Prize*—Karen Spector. *McDougall Prize*—Sonia Livingstone. *Spearman Prize*—Laura Goldstein. *G. C. Drew Price*—Linda Millwater.

*Statistical Science: Egon Pearson Prize*—T. O. Suen. *Karl Pearson Prize*—A. P. H. A. Yuen.

*Zoology: Zoology Prizes*—(1) T. Enver, (2) Lynn M. Kemp.

*Chemical and Biochemical Engineering: Goldsmid Prizes*—(1) K. I. Baker, (2) C. H. Chen, (3) A. W. Hughes.

*Civil and Municipal Engineering: Goldsmid Prizes*—T. S. Lu, (2) K. T. Tan, H. D. Thurairatnam.

*Electronic and Electrical Engineering: Goldsmid Prizes*—(1) D. H. Hague, (2) J. D. M. Kinyua, (3) J. M. Raynor.

*Mechanical Engineering: Goldsmid Prizes*—(1) J. H. Harrison, (2) A. M. Wray.

*Medical Courses — Part I Examination: Drummond Prize in Biochemistry*—J. A. Lee. *Glaxo Prize for Best Aggregate Performance in Part I*—J. A. Lee. *I.C.I. Prize in Anatomy*—S. A. Reid. *I.C.I. Prize in Physiology*—J. A. Lee.

*Medical Courses — Part II Examination: Cluff Prize in Physiology*—Diana R. Turbin. *Cuxson Gerrard Prize in Pharmacology*—Diana R. Holdright. *Drummond Prize in Biochemistry*—Diana R. Holdright. *Elga Prizes in General Pathology*—Diana R. Holdright. *Suckling Prize in Neurosciences and Behavioural Sciences*—(1) A. Gordon-Brown, (2) Caroline M. Lea-Cox, equally divided. *Wellcome Prize in Human Biology*—A. Gordon-Brown. *Wyeth Prize for Best Aggregate Performance in Part II*—Diana R. Holdright.

*Second Examination in Dental Surgery: Anatomy Prize*Gaynor E. Osborne, D. C. Trent, equally divided. *Physiology Prize*—Caroline L. Pankhurst.

## UNIVERSITY POSTGRADUATE AWARDS

*Applied Physics:* H. H. S. Ip (1st year). *English:* N. J. S. Rennie (1st year). *Microbiology:* F. T. Rossouw (1st year). *Civil Engineering:* R. K. S. Wong (1st year). *Philosophy:* H. R. Upton (2nd year). *Laws:* J. E. Stackpool (2nd year). *Anthropology:* A. N. Sirman (3rd year). *Zoology:* Miss K. Scholz (1st year). Berlin Exchange Studentship.

# APPENDIX VI

## BENEFACTIONS, DONATIONS, RESEARCH GRANTS AND CONTRACTS

The College Council makes grateful acknowledgement of the following:

ANGLO-AUSTRIAN OBSERVATORY

£13,274 for the Department of Physics and Astronomy for the production of IPCS Solenoids.

ANONYMOUS INDUSTRIAL SPONSOR

£10,860 for the Department of Civil and Municipal Engineering for the study of the effects of a sudden shortage of fuel for transport.

ASTHMA RESEARCH COUNCIL

£6,242 for the Department of Pharmacology for the study of the role of $IgG_2$ in the anaphylactic reaction.

BRITISH DIABETIC ASSOCIATION

(1) £29,731 for the Department of Anatomy and Embryology for the study of autonomic neuropathy in experimental and genetic models of diabetes.

(2) £1,188 for the Department of Biochemistry for research on hormonal regulation of triglyceride synthesis in adipose tissue.

PROFESSOR AND MRS H. E. M. BARLOW

£2,000 for the Department of Electronic and Electrical Engineering to increase the value of the Barlow prize for the most original contribution to research in the field of Electronic and Electrical Engineering.

SIR BASIL HARDINGTON BARTLETT

£10,000 for the Bartlett School of Architecture and Planning for the establishment of the Sir Herbert Henry Bartlett Scholarship Fund.

BICC GENERAL CABLES LIMITED

£10,000 for the Department of Electronic and Electrical Engineering for the development of optical data highway.

BRITISH HEART FOUNDATION

£2,072 for the Department of Physiology for the measurement of calcium transients in heart muscle.

THE BRITISH LIBRARY

(1) £5,000 Loan of equipment for the School of Library, Archive and Information Studies for study on Information Systems Dynamics.

(2) £1,250 for the School of Library, Archive and Information Studies for study of interactive information networks.

(3) £20 for the School of Library, Archive and Information Studies for Conference Fees.

(4) £37,400 for the Department of Statistics and Computer Science for the investigation of requirements and implementation of facilities for connection of UK hosts to EURONET.

(5) £260 for the Department of Statistics and Computer Science for conference expenses.

CANCER RESEARCH CAMPAIGN

(1) £2,700 for the Departments of Anatomy, Biochemistry, Botany and Genetics for supplements for various projects to cover National Salary Revisions.

(2) £849 and £428 for the Departments of Anatomy and Embryology for the investigation of tissue invasion using cells in culture.

(3) £714 and £428 for the Department of Anatomy and Embryology for the study of the decline of haemopoietic stem cells.

(4) £1,072 and £548 for the Department of Biochemistry for the study of biosynthesis and induction of P450 in rat liver.

(5) £429 for the Department of Biochemistry for the study of effects of hormones and carniogens on interaction of ribosomes with reticular membranes.

(6) £12,670 for the Department of Botany and Microbiology for the study of antimitochondrial agents in cancer therapy.

(7) £256.40 for the Department of Genetics and Biometry for studies of chromosomes and cell genetics in colon polyps.

DARESBURY LABORATORY

(1) £1,593 for the Department of Geology for the assessment of the usefulness of the JCPDS file.

(2) £24,500 for the Department of Physics and Astronomy for the Analysis of Astronomical Spectra CCP.

DEPARTMENT OF EDUCATION AND SCIENCE

£57,926 for the Department of Psychology for the development of a diagnostic/remediation procedure for failing readers.

DEPARTMENT OF THE ENVIRONMENT

(1) £5,220 for the Bartlett School of Architecture and Planning for a labour mobility survey.

(2) £3,600 for the Bartlett School of Architecture and Planning for the study of source data on health and safety in the construction industry.

(3) £790 for the Bartlett School of Architecture and Planning for a search of records of the National House Builders' Council.

(4) £33,309 for the Department of Civil and Municipal Engineering for research on the effect of change in land use on travel by public transport.

(5) £10,418 for the Department of Geography for the production of a model to predict ice formation on roads.

(6) £179 for the Department of Geography for the study of the impact of office development in the inner city.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY

(1) £51,500 for the Department of Mechanical Engineering for the production of vacuum formed stump sockets and plastic limbs.

(2) £3,267 for the Department of Mechanical Engineering for non-specific research.

(3) £916 for the Department of Mechanical Engineering for the Shape Definition project.

DEPARTMENT OF INDUSTRY

£12,516 and £390 for the Department of Mechanical Engineering for the study of ship manoeuvring in non-steady currents.

THE DRAPERS' COMPANY

£500 for the School of Library, Archive and Information Studies for the preparation of a list of papers and correspondence of Dr Karl Pearson.

H.M. TREASURY

£1,780 for the Department of Political Economy for the study of unemployment duration, income taxation and social security.

IMPERIAL CHEMICAL INDUSTRIES LIMITED

(1) £612 for the Department of Biochemistry for the study of degranulation of endoplasmic reticulum as a short term carcinogenicity test.

(2) £10,242 for the Department of Chemical and Biochemical Engineering for research on the anomalous behaviour of small crystals.

JOINT COMMITTEE ON POWDER DIFFRACTION STANDARDS

$6,000 for the Department of Geology for research on powder data of precursors of liquid crystals.

LEUKAEMIA FUND

£874 for the Department of Zoology and Comparative Anatomy for research on C-type virus proteins.

THE LEVERHULME TRUST

(1) £3,530 for the Department of Anatomy and Embryology for a post-doctoral Visiting Fellowship for Dr Frantisek Franc (Czechoslovakia).

(2) £632 for the Department of History and English for preparation of a new edition of the Domesday Book.

(3) £33,100 for the Department of Political Economy for research on growth and structural change in the world economy.

MEDICAL RESEARCH COUNCIL

(1) £41,386 for the Department of Anatomy and Embryology for the study of the distribution of small ions during early development of the amphibian embryo.

(2) £25,039 and £122 for the Department of Anatomy and Embryology for research on the effect of stimulation of diseased muscle.

(3) £2,275 for the Department of Anatomy and Embryology.

(4) £1,742 for the Department of Anatomy and Embryology for research on surgical microvascular anastamoses.

(5) £1,344 for the Department of Anatomy and Embryology for the study of factors controlling early development of nerve and muscle cells.

(6) £509 for the Department of Anatomy and Embryology for the study of the role of cyclic AMP dependent protein phosphorylation in the regulation of differentiation of muscle.

(7) £97 for the Department of Anatomy and Embryology for the evaluation of the uses of haemopoietic stem cell markers.

(8) £98,086 for the Department of Biophysics for research on the mechanisms of synaptic function.

(9) £37,662 for the Department of Electronic and Electrical Engineering for the study of the mechanical properties of developing tissues by scanning acoustic microscopy.

(10) £30,184 for the Department of Genetics and Biometry for the study of links between inherited markers and traits of biological importance.

(11) £72 for the Department of Genetics and Biometry for studies of gonads in male-sterile mice with chromosome translocations.

(12) £26,481 for the Department of Pharmacology for the study of Stoichiometry of ligand-receptor binding etc. in a secretory system.

(13) £7,111 for the Department of Pharmacology for studies of membrane mediated events.

(14) £90,461 for the Department of Phonetics and Linguistics for research on extra-cochlear electrical stimulation for speech pattern presentation.

(15) £88,154 for the Department of Physiology for studies of nerve and muscle.

(16) £37,518 for the Department of Physiology for research on intracellular pH and energetics of muscular contraction.

(17) £19,396 for the Department of Physiology for the study of developmental pathology.

(18) £15,743 for the Department of Physiology for research on the effect of distension and emptying on the walls of the uterus.

(19) £250 for the Department of Physiology for research on the immediate energy supply for muscular contraction.

(20) £34,150 for the Department of Psychology for the study of mechanisms of vocal control.

(21) £738 for the Department of Zoology and Comparative Anatomy for research on the immunology of the nervous system.

MENTAL HEALTH FOUNDATION

£1,614 for the Department of Psychology for the analysis of perceptual motor integration in sub-normal subjects.

MINISTRY OF DEFENCE

(1) £6,566 and £6,400 for the Department of Computer Science for the use of ARPANET services.

(2) £10,348 for the Department of Electronic and Electrical Engineering for the determination of the interaction of surface and longitudinal waves with defects.

(3) £6,805 for the Department of Electronic and Electrical Engineering for research on the deposition of zinc oxide films.

(4) £2,423 for the Department of Electronic and Electrical Engineering for studies of a high resolution array signal processing radar system.

(5) £12,420 for the Department of Phonetics and Linguistics for research on a segmental approach to speech recognition.

THE MULTIPLE SCLEROSIS SOCIETY

£3,840 and £3,037 for the Department of Zoology and Comparative Anatomy for the study of origins and properties of oligodendrocytes.

MUSCULAR DYSTROPHY ASSOCIATION

(1) $35,638 for the Department of Biophysics for research on Beta-bungarotoxin as a molecular probe for studying transmitter release at the neuromuscular junction.

(2) $17,500 for the Department of Biophysics for a Fellowship for Dr F. Grohovaz.

(3) $1,000 for the Department of Pharmacology for a Fellowship Institutional Allowance.

MUSCULAR DYSTROPHY ASSOCIATION OF CANADA

C.$1,300 for the Department of Biophysics for Fellowship expenses.

NATIONAL FUND FOR RESEARCH INTO CRIPPLING DISEASES

(1) £792, £408 and £274 for the Department of Genetics and Biometry for research on causes of anencephaly, spina bifida, etc.

(2) £622, £132 and £132 for the Department of Zoology and Comparative Anatomy for the study of mechanisms in diseases of the nervous system and muscle.

NATIONAL INSTITUTES OF HEALTH

$3,000 for the Department of Zoology and Comparative Anatomy for a Fellowship Institutional Allowance.

NATIONAL MULTIPLE SCLEROSIS SOCIETY

$1,000 for the Department of Zoology and Comparative Anatomy for a Fellowship Institutional Allowance.

NORTH ATLANTIC TREATY ORGANISATION

20,000 Belgian francs for the Department of Chemistry for research on complementary dioxabicyclizations.

NATURAL ENVIRONMENT RESEARCH COUNCIL

(1) £5,661 for the Department of Geology for the study of the mechanisms of formation and diagnosis of sedimentary carbonate-fluoropatite and phosphorite rocks.

(2) £5,189 for the Department of Geology for research on the influence of cavities and cracks on the mechanical properties of rocks.

(3) £692 for the Department of Physics and Astronomy for the study of surface processes and crustal evolution on the terrestial planets.

(4) £8,372 and £563 for the Department of Anatomy and Embryology for studies on the behaviour of the Indian millipede.

THE NUFFIELD FOUNDATION

(1) £297.57 for the Department of Anthropology for the study of the impact of advance in medical science on the Greek Cypriot community in London.

(2) £22,203 and £2,463 for the Department of Botany and Microbiology for research on the natural regeneration of oak and beech.

(3) £992.08 for the Department of Civil and Municipal Engineering for the writing of books on the car market and on urban transport and land use.

(4) £3,000 for the Department of Spanish and Latin American Studies for the Small Grants Scheme for undergraduate teaching.

PURDUE UNIVERSITY

$1,500 for the Department of Biophysics for the study in cellular biophysics of neuromuscular function.

THE ROYAL SOCIETY

(1) £153,036 for the Department of Biophysics for the Foulerton Research Professorship for Professor Miledi.

(2) £132,760 for the Department of Chemistry for a research professorship for Professor Sondheimer.

(3) £82,801 for the Department of Chemistry for a Senior Research Fellowship for Dr C. H. Chothia on structure and activity of proteins.

(4) £6,938.70 for the Department of Electronic and Electrical Engineering for research on Schottky barrier diodes.

(5) £12,000 for the Department of Physics and Astronomy for the construction of an image archiving system.

(6) £110,713 for the Department of Physiology for a research professorship for Professor Sir Andrew Huxley.

RUTHERFORD LABORATORY

(1) £1,320 for the Department of Geology for the study of short range order in isotopic solid solutions.

(2) £10,838 for the Department of Physics and Astronomy for the study of charmed hadrons using nuclear emulsion.

RUTHERFORD AND APPLETON LABORATORIES

£7,414 for the Department of Computer Science for the provision of computer services for UK research workers of the US—ARPA Network.

SCIENCE RESEARCH COUNCIL

(1) £30,500 for the Department of Biochemistry for research on the function of the $Ca^2$ + carriers of cardiac mitochondria in regulating intramitochondrial $Ca^2$.

(2) £11,861 for the Department of Chemical and Biochemical Engineering for research on flow through gas-fluidised beds.

(3) £50,000 for the Department of Chemistry for Powder X-Ray studies of Inorganic solids.

(4) £17,421 for the Department of Chemistry for Electronic and resonance studies of radical ions.

(5) £16,100 for the Department of Chemistry for research on O-Silylated enolate alkylation.

(6) £14,050 for the Department of Chemistry for the study of the synthesis and reactions of prostaglandin endooper-oxide model compounds.

(7) £12,750 for the Department of Chemistry for the biosynthesis of monoterpenes in rosa species.

(8) £350 for the Department of Chemistry for computer simulation of structural chemistry.

(9) £445,304 for the Department of Electronic and Electrical Engineering for the Microwave Research Unit.

(10) £39,583 for the Department of Electronic and Electrical Engineering for the design of a flexible robot arm.

(11) £19,800 for the Department of Electronic and Electrical Engineering for research on open resonators for measurement of dielectric properties.

(12) £14,798 for the Department of Electronic and Electrical Engineering for research on a coherent optical fibre system for remote telemetry.

(13) £2,550 for the Department of Mathematics for research in convexity and complexity.

(14) £170,064 for the Department of Physics and Astronomy for Film Analysis, 1980–82.

(15) £133,890 and £56,943 for the Department of Physics and Astronomy for a balloon programme of infrared astronomy.

(16) £113,200 for the Department of Physics and Astronomy for a Clean Room at Mullard Space Science Laboratory.

(17) £45,100 for the Department of Physics and Astronomy for studies of planetary atmospheres.

(18) £30,638 for the Department of Physics and Astronomy for ultraviolet astronomy.

(19) £24,608 for the Department of Physics and Astronomy for observations of inter-stellar gas clouds.

(20) £22,900 for the Department of Physics and Astronomy for the study of the theory of electron impact ionization of atomic systems.

(21) £21,960 for the Department of Physics and Astronomy for the study of electron collisions with positive ions.

(22) £20,691 for the Department of Physics and Astronomy for the interpretation of observations of planetary nebulae and their central stars.

(23) £17,737 for the Department of Physics and Astronomy for the construction of a Detector Head for Image Photon Counting System.

(24) £17,346 for the Department of Physics and Astronomy for the UK Petrel Campaign, Tromso/Andenes.

(25) £14,760 for the Department of Physics and Astronomy for Film Analysis equipment.

(26) £3,824 and £1,287 for the Department of Physics and Astronomy for Observations at UKIRT.

(27) £1,591, £1,456, £1,402, £1,294, £1,365 for the Department of Physics and Astronomy for Observations at SAAO.

(28) £1,153, £1,102 and £919 for the Department of Physics and Astronomy for Observations at SAAO.

(29) £952 for the Department of Physics and Astronomy for Observations at Hale Observatories.

(30) £300 for the Department of Physics and Astronomy for the use of CRAY computer for the calculation of atomic data.

(31) £246 for the Department of Physics and Astronomy for Observations at RGO.

(32) £24,579 for the Department of Zoology and Comparative Anatomy for the study of locomotion in some amoeboid protozoa.

SMITH, KLINE AND FRENCH LABORATORIES

$1,500 for the Faculty of Medical Sciences for the support of the Smith, Kline and French Lectureship Fund.

SOCIAL SCIENCE RESEARCH COUNCIL

(1) £5,226 for the Department of Anthropology for the study of marriage alliance and group formation in East Cameroon.

(2) £4,043 for the Department of Anthropology for the study of the ethnography of the Dowayo, Northern Cameroon.

(3) £18,761 for the Department of Geography for a review of office location policy in Britain.

(4) £903 for the Department of Geography for study of the historical geography of the Western Torres Strait Islands.

(5) £85 for the Department of Geography for the travel expenses of an exchange scientist.

(6) £8,519 for the Department of History for the study of variations of housing conditions in 19th Century cities.

(7) £2,500 for the Department of Phonetics and Linguistics for a colloquium on mutual knowledge.

(8) £2,447 for the Department of Phonetics and Linguistics for a study of language typology and linguistic universals.

(9) £237 for the Department of Phonetics and Linguistics for the study of the structure of an object-verb-subject language.

(10) £7,124 for the Department of Political Economy for 'The North Sea: a study of national policy making in the international setting'.

(11) £23,369 for the Department of Psychology for research on the legibility criteria for maps.

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

(1) £8,428 for the Department of Chemical and Biochemical Engineering for scale up crystallization kinetics and crystallizer design.

(2) £1,392 for the Department of Chemistry for the study of the theory of fast ion conduction.

(3) £2,924 for the Department of Geography for the study of stable isotopes in natural carbonates.

(4) £7,500 for the Department of Physics and Astronomy for the extrapolation of ionization and excitation rate coefficients.

UNITED STATES AIR FORCE

$6,200 for the Department of Physics and Astronomy for research on energetic electron detectors.

UNITED STATES PUBLIC HEALTH SERVICE

(1) $17,120 for the Department of Anatomy and Embryology for the control of somatosensory transmission.

(2) $3,000 for the Department of Biophysics for a Fellowship Institutional Allowance.

(3) $36,508 for the Department of Chemistry for the study of conformations of psychoactive substances.

(4) $20,153 for the Department of Chemistry for the study of the three-dimensional structure of protein molecules.

(5) $3,000 for the Department of Zoology and Comparative Anatomy for a Fellowship Institutional Allowance.

THE WELLCOME TRUST

(1) £50,000 and £4,850 for the Department of Anatomy and Embryology for research on pain mechanisms in man and animals.

(2) £6,219 for the Department of Anatomy and Embryology for studies in neuroanatomy and neurophysiology.

(3) £2,253 and £2,190 for the Department of Anatomy and Embryology for the study of the physiology for purinergic nerves.

(4) £467 and £339 for the Department of Anatomy and Embryology for the study of the role of transmitter in the development of the neuromuscular junction.

(5) £2,253 for the Department of Biophysics for studies of intracellular calcium during activity of slow and fast muscle.

(6) £2,270 and £1,531 for the Department of Chemistry for studies on histamine secretion from the mast cell.

(7) £37,920 and £3,960 for the Department of Pharmacology for research on the mode of action of benzodiazepines.

(8) £37,539 for the Department of Pharmacology for research on neurotransmitter systems and the actions of analgesic agents.

(9) £17,063 for the Department of Physiology for the study of proteins in cerebro spinal fluid and brain during foetal development.

(10) £14,798 and £1,237 for the Department of Physiology for studies on gamma motoneurones in the cat.

(11) £1,166 and £845 for the Department of Physiology for research on muscular contraction using nuclear magnetic resonance and other techniques.

(12) £932 for the Department of Physiology for the study of disorders of amino acid metabolism in the wobbler mutant mouse.

(13) £500 for the Department of Physiology for the research expenses of Dr G. O. Fossan.

## GIFTS TO THE LIBRARY

MRS C. M. BADGER
Books on ancient history.

DR N. DE V. HEATHCOTE
250 volumes for the History and Philosophy of Science collection and two boxes of papers.

PROFESSOR J. HURSTFIELD
A collection of research material, lectures and broadcasts.

PROFESSOR E. S. PEARSON (THE LATE)
20 boxes of papers and correspondence.

TRUSTEES OF THE JAMES JOYCE ESTATE
A donation of £1,000.

# APPENDIX VII

## COLLEGE ACCOUNTS 1979–80

The Balance Sheet and the Income and Expenditure Account for the year will be found on pages 157–9.

## BALANCE SHEET

### LIABILITIES

The Capital Account reflects a net increase of £808,447 due mainly to the purchase of 87–97 Gower Street and 105 Camden Road, and the value on occupation of the Ifor Evans Hall Annexe.

### ASSETS

Freehold and Leasehold Land and Building increased by £1,091,719 mainly reflecting the movement described above.

### TRUST FUNDS

The College holds endowments in the form of 226 separate trust funds with a total value of £2,355,806. The funds yielded a total income of £276,800.

## INCOME AND EXPENDITURE

The income for the year exceeded expenditure by £342,907. The surplus carried forward on the Income and Expenditure Account was £195,783.

Income exceeded that for 1978–79 by £6,746,280. Grants from the Court of the University increased by £4,339,547. Fees increased by £634,631 and grants for research increased by £1,462,651.

Expenditure, including allocations to and from Reserves, was £5,916,451 more than in 1978–79. An additional £4,333,897 net was spent on academic departments and services. Maintenance of premises cost an additional £1,105,033 net. An additional £425,886 net was spent on administration, and miscellaneous expenditure increased by £51,635 net.

Income and expenditure under the main classifications in 1979–80 as compared with 1978–79 and with the corresponding year of the previous quinquennium, are shown in the following table.

| EXPENDITURE | 1974–75 £ | % | 1978–79 £ | % | 1979–80 £ | % |
|---|---|---|---|---|---|---|
| Salaries and Pensions of Teaching Staff | 4,626,380 | 34.8 | 7,558,759 | 32.7 | 9,490,386 | 32.7 |
| Departmental Expenses, including Library | 3,214,249 | 24.2 | 5,088,099 | 22.0 | 6,027,718 | 20.8 |
| Research Grants | 2,193,199 | 16.5 | 4,153,573 | 18.0 | 5,616,224 | 19.3 |
| Maintenance of Premises .. | 1,920,756 | 14.4 | 3,797,811 | 16.4 | 4,902,844 | 16.9 |
| Administration | 951,191 | 7.1 | 1,557,226 | 6.7 | 1,983,112 | 6.8 |
| Other .. .. | 388,882 | 3.0 | 958,249 | 4.2 | 1,009,884 | 3.5 |
| | £13,294,657 | 100.0 | £23,113,717 | 100.0 | £29,030,168 | 100.0 |

| INCOME | | | | | | |
|---|---|---|---|---|---|---|
| Endowments .. | 159,584 | 1.2 | 204,092 | 0.9 | 272,453 | 0.9 |
| Grants .. .. | 10,043,997 | 75.4 | 13,721,479 | 60.6 | 18,061,026 | 61.5 |
| Donations .. | 238,360 | 1.8 | 531,990 | 2.3 | 704,612 | 2.4 |
| Fees .. .. .. | 486,602 | 3.6 | 3,550,196 | 15.7 | 4,184,827 | 14.3 |
| Grants for Research .. | 2,193,199 | 16.4 | 4,153,573 | 18.4 | 5,616,224 | 19.1 |
| Research Training Support Grant | 56,090 | 0.4 | 61,334 | 0.3 | 63,651 | 0.2 |
| Other .. .. | 160,143 | 1.2 | 404,131 | 1.8 | 470,282 | 1.6 |
| | £13,337,975 | 100.0 | £22,626,795 | 100.0 | £29,373,075 | 100.0 |

## EXTRA-BUDGETARY ACTIVITIES

The College administers the finances of many research projects supported from outside sources. 575 were being pursued actively at 31 July 1980. Income and expenditure increased from £4,153,573 in 1978–79 to £5,616,224 in 1979–80.

# BALANCE SHEET 31 JULY 1980
## (EXCLUDING FACULTY OF CLINICAL SCIENCES)

| 31.7.79 £ | | £ |
|---|---|---|
| *16,283,429* | Capital Account .. .. .. | 17,091,876 |
| *4,553,457* | Reserves and Amounts Set Aside | 5,141,818 |
| *1,405,832* | Earmarked Funds .. .. .. | 1,500,746 |
| *1,886,906* | Current Liabilities .. .. .. | 2,532,388 |
| *24,129,624* | | 26,266,828 |
| *2,251,745* | Trust Funds .. .. .. .. | 2,335,806 |
| *£26,381,369* | | £28,602,634 |

| 31.7.79 £ | | £ |
|---|---|---|
| *16,067,966* | Freehold Land and Buildings — .. See Note below | 17,159,685 |
| *411,606* | Leasehold Land and Buildings .. .. | 407,046 |
| *16,479,572* | | 17,566,731 |
| *50,484* | Capital Works in Progress .. .. | — |
| *3,608,498* | Investments at lower of Cost and Market Value .. .. .. .. .. .. *(Market Value at 31 July 1980: (3,401,541; 31 July 1979: £3,608,498)* | 3,381,098 |
| *1,407,924* | Expenditure Recoverable from Grants | 2,464,162 |
| *2,583,146* | Current Assets .. .. .. .. .. | 2,854,837 |
| *24,129,624* | | 26,266,828 |
| *2,251,745* | Trust Funds .. .. .. .. .. | 2,335,806 |
| *£26,381,369* | | £28,602,634 |

NOTES

*Freehold and Leasehold Land and Buildings*

(a) Freehold and leasehold land and buildings in the accounts do not include fixtures, furniture and equipment. The cost of these assets is written out of the accounts on purchase or on completion of a project against the corresponding grants or other monies received and are not therefore included in capital account.

(b) Freehold land and buildings are stated at a valuation made in 1959 on the basis of the then current land values and building costs with subsequent additions at cost or valuation, as estimated by the College authorities on a basis which excludes professional fees. No depreciation is charged because an annual allocation is made to long-term maintenance fund.

(c) There are commitments for future expenditure on capital projects which amount to £814,000 at 31 July 1980 *(1979 £336,000)*.

J. R. TOVELL
*Secretary*

D. V. BOWLES
*Finance Officer*

# INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 JULY 1980

## EXPENDITURE

| 1978–79 £ | | | 1979–80 £ | £ |
|---|---|---|---|---|
| | **Administration** | | | |
| 1,203,293 | Salaries | | 1,538,778 | |
| 264,377 | Advertising, Printing, Stationery Postage and Telephone | | 309,312 | |
| 64,719 | Other Expenses (including Professional Fees) | | 109,732 | |
| (1,532,389) | | | | 1,957,822 |
| | **Academic Departments** | | | |
| 7,196,928 | Salaries of Teaching Staff | | 9,055,476 | |
| 2,015,897 | Departmental Wages: Technical Staff | | 2,442,549 | |
| 763,928 | Secretarial Staff | | 857,719 | |
| 1,524,825 | Departmental and Laboratory Maintenance | | 1,794,729 | |
| 4,153,573 | Research Expenditure covered by grants on Research Contracts (contra opposite) | | 5,616,224 | |
| 12,706 | Other Expenditure | | 28,021 | |
| (15,667,857) | | | | 19,794,718 |
| | **Academic Services** | | | |
| 387,518 | Libraries: Salaries | 469,845 | | |
| 338,038 | General Expenditure | 352,412 | 822,257 | |
| 16,973 | Central Photographic Service | | 24,937 | |
| 24,605 | Audio Visual Aids | | 32,468 | |
| 7,466 | Radiation Hazards | | 11,697 | |
| 177 | Miscellaneous | | – | |
| 165 | Small Group Teaching | | – | |
| (774,942) | | | | 891,359 |
| | **Maintenance of Premises** | | | |
| 598,440 | Rates | | 1,022,504 | |
| 66,687 | Insurance | | 69,907 | |
| | Rents and other payments for use of buildings: | | | |
| 31,093 | Student Accommodation | 19,604 | | |
| 110,579 | Other Buildings | 82,710 | 102,314 | |
| 513,480 | Heat, Light, Water and Power | | 730,928 | |
| 2,112,773 | Repairs and Maintenance of Buildings including amounts set aside for long-term maintenance | | 2,414,053 | |
| 366,806 | Wages of Porters and Attendants | | 492,851 | |
| 52,356 | Other Expenses | | 64,661 | |
| (3,852,214) | | | | 4,896,618 |
| | **General Educational** | | | |
| 20,084 | Examinations | | 21,897 | |
| 77,928 | Scholarships and Prizes | | 67,561 | |
| 17,780 | Public Lecturers | | 18,509 | |
| 19,000 | Staff Attendance at Conferences | | 19,000 | |
| 66,113 | Student Vacation Grants | | 66,640 | |
| 1,604 | Miscellaneous | | 1,000 | |
| (202,509) | | | | 194,607 |
| | **Student Facilities and Amenities** | | | |
| 221,131 | Grant to Students Union | | 253,524 | |
| 27,691 | Collegiate Theatre and Chapter | | 30,291 | |
| [illegible] | Salaries: Warden of Halls of Residence | | 2,615 | |

## INCOME

| 1978–79 £ | | 1979–80 £ | £ |
|---|---|---|---|
| | **Endowments** | | |
| 204,092 | Income of Trust Funds appropriated for purposes specified by Trusts against expenditure included opposite | | 272,453 |
| | Donations and Subscriptions (including Ministry of Overseas Development £104,000 1978–79 £52,500) | | |
| | Appropriated for: | | |
| 9,186 | Libraries | 12,702 | |
| 44,946 | Scholarships and Bursaries | 29,713 | |
| 254,536 | Salaries and Superannuation | 337,202 | |
| 223,322 | Departmental and Laboratory Maintenance | 324,995 | |
| (531,990) | | | 704,612 |
| | **Grants from University Court** | | |
| 12,712,000 | General | 15,298,000 | |
| 203,000 | Supplementary | 1,266,000 | |
| – | Arrears of Building Maintenance | 190,000 | |
| (12,915,000) | | | 16,754,000 |
| – | Short Course – Energy Conservation | 2,130 | |
| 7,200 | Computer Accounting System | 12,590 | |
| – | Microprocessor Education | 23,900 | |
| 1,506 | Hayter Committee | 4,514 | |
| 115,949 | Minor Building Projects | 101,138 | |
| 30,737 | M.Sc. Course in Ergonomics | 3,200 | |
| 2,647 | Parry | 1,980 | |
| 598,440 | Rates | 1,022,504 | |
| – | Industrial Liaison Officer | 15,870 | |
| | University College/Royal Free Medical Project – Administration | 11,200 | |
| 8,500 | Supplementary Maintenance | 108,000 | |
| 41,500 | | | |
| (806,479) | | | 1,307,026 |
| 61,334 | Research Council Training Support Grants | | 63,651 |
| 3,550,196 | Fees | | 4,184,827 |
| | Grants for Research, including research contracts (contra opposite) | | 5,616,224 |
| 4,153,573 | Contributions for Services Rendered | | 125,246 |
| 87,814 | College Properties – Rents receivable | | 37,526 |
| 24,258 | Other Items: | | |
| | Special Funds Appropriation: | | |
| 24,714 | Earmarked Funds | 22,889 | |
| 226,488 | Interest Receivable | 228,043 | |
| 40,857 | Miscellaneous | 58,578 | |
| (292,059) | | | 309,510 |
| | **Allocation from Reserves at 1 August 1979** | | |
| | Revenue Grants: | | |
| 9,045 | Administrative Staff Training | 8,842 | |
| 14,000 | Academic Departments | 15,650 | |
| [illegible] | Departmental and Laboratory Maintenance | [illegible] | |
| [illegible] | Academic Services | [illegible] | |

| | | | | |
|---|---|---|---|---|
| *4,689* | Salaries: Wardens of Halls of Residence .. | 2,615 | | |
| *65,516* | College Health Centre .. .. .. .. | 71,985 | | |
| *3,810* | Students' Purposes Fund .. .. .. .. | 913 | | |
| *733* | Crabb Robinson and Ealing Hall Funds | 803 | | |
| *14,150* | Central Admissions Scheme .. .. .. | 20,394 | | |
| *5,398* | Miscellaneous .. .. .. .. .. .. | 8,022 | | |
| *13,664* | Student Counsellor Service .. .. .. | 16,555 | | |
| *9,517* | Careers Office .. .. .. .. .. .. | 13,097 | | |
| *16,000* | Hardship Fund .. .. .. .. .. .. | (15,473) | | |
| *(382,299)* | | | 402,726 | |
| | Miscellaneous | | | |
| *295,522* | Staff Pensions .. .. .. .. .. .. | 351,588 | | |
| *4,103* | Grants from Benevolent Funds .. .. | 5,570 | | |
| *1,094* | Interest on Overdrafts, etc. .. .. .. | 5,814 | | |
| *43,154* | Sundries .. .. .. .. .. .. .. | 38,221 | | |
| *2,014* | 150th Anniversary .. .. .. .. .. | — | | |
| *(345,887)* | | | 401,193 | |
| *56,860* | Transfer to Equipment and Furniture .. | | 4,382 | |
| | Capital Expenditure met from Income: | | | |
| *136,822* | Minor Building Projects 161,140 | | | |
| *44,377* | Other 133,270 | | 294,410 | |
| *156,616* | Provision for Salary Awards .. .. .. | 399,530 | | |
| | *Less:* Provision for Salary Awards 1978–79 | 156,616 | 242,914 | |
| *23,152,772* | | | 29,080,749 | |
| | Allocation to Reserves at 31 July 1980 | | | |
| *100,000* | Transfer to College Fund .. .. .. .. | | 50,000 | |
| | *Revenue Grants:* | | | |
| *8,842* | Administrative Staff Training .. .. | 7,672 | | |
| *15,650* | Academic Departments .. .. .. | 22,687 | | |
| *615,175* | Departmental and Laboratory Maintenance | 474,907 | | |
| *84,028* | Academic Services .. .. .. .. | 83,815 | | |
| *(6,343)* | Repairs and Maintenance of Building .. | 13,536 | | |
| *57,267* | Minor Works .. .. .. .. .. | 126,058 | | |
| *347* | Student Vacation Grants .. .. .. | 6,707 | | |
| *1,812* | Miscellaneous .. .. .. .. .. | 817 | | |
| | Development Programme: | | | |
| *41,694* | Relocation and Other Costs .. .. | 41,694 | | |
| *(818,472)* | | | 777,893 | |
| | Earmarked Funds: | | | |
| *(26,114)* | Minor Building Projects .. .. .. | | (86,116) | |
| *2,773* | Small Group Teaching .. .. .. .. | | 2,773 | |
| *24,047,903* | | | 29,825,299 | |
| — | Excess of Income over Expenditure for the Year .. .. .. .. .. .. .. | | 342,907 | |
| *£24,047,903* | | | £30,168,206 | |
| *486,922* | Excess of Expenditure over Income .. .. | | — | |
| *(147,124)* | Balance at 31 July 1980 Carried to Reserve | | 195,783 | |
| *£339,798* | | | £195,783 | |

| | | | |
|---|---|---|---|
| *647,083* | Departmental and Laboratory Maintenance | 615,175 | |
| *109,418* | Academic Services .. .. .. .. | 84,028 | |
| *61,713* | Repairs and Maintenance .. .. .. | (6,343) | |
| *38,259* | Minor Works .. .. .. .. .. | 57,267 | |
| *11,461* | Student Vacation Grants .. .. .. | 347 | |
| *3,816* | Miscellaneous .. .. .. .. .. | 1,812 | |
| | Development Programme: | | |
| *41,694* | Relocation and Other Costs .. .. .. | 41,694 | |
| *(936,489)* | | | 818,472 |
| | Earmarked Funds: | | |
| *(5,241)* | Minor Building Projects .. .. .. | | (26,114) |
| *2,938* | Small Group Teaching .. .. .. .. | | 2,773 |
| *23,560,981* | | | 30,168,206 |
| | Excess of Expenditure over Income for the Year | | |
| *486,922* | | | £30,168,206 |
| *£24,047,903* | | | |
| *339,798* | Balance at 1 August 1979 .. .. .. .. | | (147,124) |
| — | Excess of Income over Expenditure for the Year .. .. .. .. .. .. .. .. | | 342,907 |
| *£339,798* | | | £195,783 |

| | 1980 £ | 1979 £ |
|---|---|---|
| FIXED ASSETS (Notes 1–2) | | |
| Freehold and leasehold property and related fixtures and fittings | 1,682,140 | 1,559,221 |
| Rayne Institute building and related fixtures, equipment and furniture | 1,972,218 | 1,933,090 |
| Minibuses | 11,644 | 11,644 |
| | £3,666,002 | £3,503,955 |

INVESTMENTS

| | *Market value at 31 July 1980* £ | *Market value at 31 July 1979* £ | 1980 £ | 1979 £ |
|---|---|---|---|---|
| Rockefeller Fund | 691,537 | 625,797 | 585,558 | 587,266 |
| Appeal Funds | 812,801 | 741,451 | 693,183 | 702,243 |
| General (including Trust) Funds | 471,983 | 427,605 | 399,328 | 402,345 |
| Sports Ground Fund | 189,590 | 194,550 | 198,316 | 198,316 |
| | £2,165,911 | £1,989,403 | £1,876,385 | £1,890,170 |

| | | |
|---|---|---|
| CURRENT ASSETS | | |
| Cash on deposit at banks (relating to various funds) | 727,409 | 593,129 |
| Cash in current account and in hand | 59,568 | 49,498 |
| Sundry debtors | 301,060 | 159,835 |
| Prepayments | 114,569 | 40,807 |
| Stocks | 15,792 | 15,142 |
| | £1,218,398 | £858,411 |
| CURRENT LIABILITIES | | |
| University College | (394,215) | — |
| Sundry creditors and accruals | (218,685) | (501,778) |
| | (£612,900) | (£501,778) |
| | £6,147,885 | £5,750,758 |

NOTES

1. Freehold and leasehold property and certain equipment, furniture, fixtures and fittings which have not been funded in other ways, are capitalised and are stated at cost without deducting any capital grants received from University Court. Certain other assets of this nature are not shown as fixed assets where grants and endowments provide for their purchase or they have been charged against reserves or amounts set aside.

2. There are certain properties and other fixed assets which are not included at any value in the books of the Faculty and it is not considered appropriate at the present time to incur costs in estimating their value for the purposes of these accounts. In addition certain other property is included in the balance sheet at 31 July 1980 at cost; the value of this property is considerably in excess of the amounts stated and no recognition of this substantial understatement of value has been made in these accounts.

SCIENCES

LY 1980

| Represented by: | 1980 £ | 1979 £ |
|---|---|---|
| CUMULATIVE CAPITAL GRANTS RECEIVED | | |
| University Court (capital grants excluding Rayne Institute) | 1,076,828 | 994,748 |
| Wellcome Trust | 15,000 | 15,000 |
| Marks & Spencer | 5,000 | 5,000 |
| Rayne Institute | 1,866,311 | 1,524,101 |
| Camden Area Health Authority | 14,670 | 20,000 |
| Contributions from Revenue | 40,839 | – |
| | £3,018,648 | £2,558,849 |
| VARIOUS FUNDS | | |
| Rockefeller | 814,577 | 794,672 |
| Clifford Pugh House | 135,449 | 135,449 |
| Sports Ground | 400,609 | 717,758 |
| Appeal Funds | 817,277 | 761,603 |
| Trust and Endowment Funds | 326,555 | 320,842 |
| Other Designated Funds | 21,437 | 14,487 |
| Discretionary Funds | 367,470 | 218,907 |
| | £2,883,374 | £2,963,718 |
| RESERVES AND AMOUNTS SET ASIDE | | |
| Equipment | (695) | 1,278 |
| Hostel | – | 3,388 |
| Club House Bar | 5,775 | 3,201 |
| Staff Pension Scheme | 16,186 | 22,494 |
| Improvement and conversions | 1,079 | 21,261 |
| Repairs and renewals | 11,123 | 27,361 |
| Lift renewal | 14,400 | 15,335 |
| Minibuses renewal | 12,320 | 10,231 |
| Mill Hill land compensation | 46,557 | 46,557 |
| Long-Term Maintenance | 105,000 | – |
| Minor Works | 20,000 | – |
| | £231,745 | £151,106 |
| BALANCE ON INCOME AND EXPENDITURE ACCOUNT | £14,118 | £77,085 |

J. R. TOVELL
*Secretary*

D. V. BOWLES
*Finance Officer*

| | | |
|---|---|---|
| | £6,147,885 | £5,750,758 |



K

| | 1980 £ | 1980 £ | 1979 £ | 1979 £ |
|---|---|---|---|---|
| INCOME | | | | |
| Grants from University Court | | 2,429,479 | | 1,872,898 |
| Earmarked Grant for rates | | 67,063 | | 59,283 |
| Student fees | | 312,296 | | 272,459 |
| Endowments | | 12,914 | | 10,908 |
| Grants for research | | 963,040 | | 794,303 |
| Contributions for services rendered | | 115,159 | | 92,196 |
| Computer Board Grant | | 21,072 | | 13,453 |
| Training Support Grants | | 1,125 | | 750 |
| Other Income | | 63,018 | | 72,762 |
| | | £3,985,166 | | £3,189,012 |
| EXPENDITURE | | | | |
| Academic Departments: | | | | |
| Salaries and Wages | 1,804,608 | | 1,389,843 | |
| Departmental Expenses | 96,307 | 1,900,915 | 77,808 | 1,467,651 |
| Expenditure on research | | 1,088,950 | | 883,612 |
| Academic Services: | | | | |
| Library | 35,935 | | 34,553 | |
| Museum | 9,965 | | 7,930 | |
| Computer | 21,644 | | 14,138 | |
| Photo and Audio-Visual Aids | 50,458 | 118,002 | 37,735 | 94,356 |
| General Educational Expenditure: | | | | |
| Examination Expenses | 242 | | 705 | |
| Fellowships met from general income | 1,148 | | 3,500 | |
| Prizes met from general income | 50 | | 59 | |
| Vacation Studies Grants | 136 | | 455 | |
| Other Educational Expenses | 6,089 | 7,665 | 4,364 | 9,083 |
| Maintenance of Premises: | | | | |
| Rates | 67,063 | | 59,283 | |
| Rent | 1,670 | | 2,005 | |
| Insurance | 17,609 | | 14,469 | |
| Heat, light, water, power | 142,450 | | 121,500 | |
| Cleaning and custodial services | 145,211 | | 110,566 | |
| Repairs | 104,708 | | 113,845 | |
| Telephones | 54,124 | 532,835 | 42,103 | 463,771 |
| Administration: | | | | |
| Salaries | 166,638 | | 142,103 | |
| Office and Other Expenses | 13,807 | 180,445 | 10,351 | 152,454 |
| Carried Forward | | 3,828,812 | | 3,070,927 |

E YEAR ENDED 31 JULY 1980

| | 1980 | | 1979 | |
|---|---|---|---|---|
| | £ | £ | £ | £ |
| Brought Forward | | 3,828,812 | | 3,070,927 |
| Student facilities and amenities: | | | | |
| Grants to Student Societies | — | | 50 | |
| Salaries of Hostel Wardens | 1,750 | | 1,500 | |
| Deficit on Refectory | 22,456 | | 19,371 | |
| Deficit on Hostels | 14,626 | | (455) | |
| Student Health | 830 | 39,662 | 853 | 21,319 |
| General: | | | | |
| Alterations to buildings | 4,907 | | 69,513 | |
| Pensions met from general income | 45,388 | | 37,431 | |
| Entertainment | 4,364 | 54,659 | 2,737 | 109,681 |
| Allocation to Reserves: | | | | |
| Building repairs and renewals | — | | 20,000 | |
| Long-Term Maintenance | 105,000 | | — | |
| Minor Works | 20,000 | 125,000 | — | 20,000 |
| | | £4,048,133 | | £3,221,927 |
| Deficit for the year | | (62,967) | | (32,915) |
| Surplus brought forward | | 77,085 | | 110,000 |
| Surplus carried forward | | £14,118 | | £77,085 |